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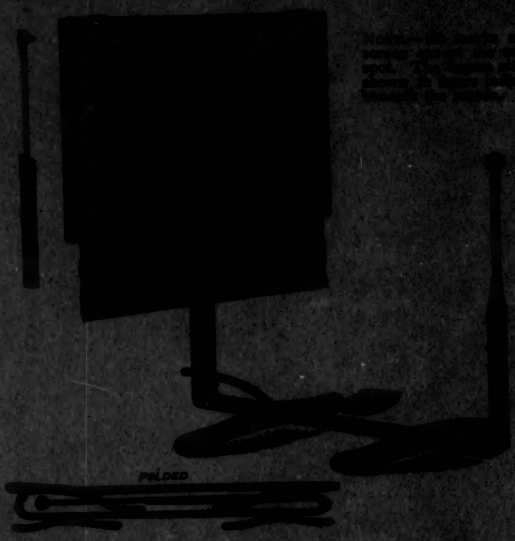

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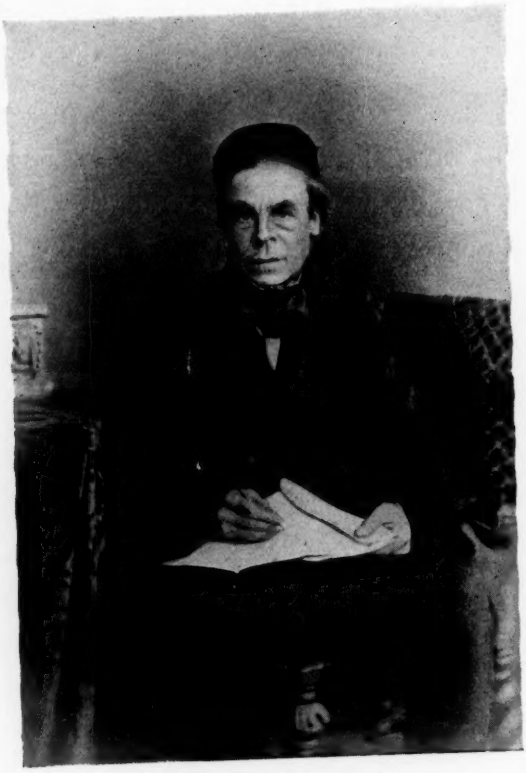

THOMAS WHARTON JONES

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12.—THOMAS WHARTON JONES

BY

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THE biographer of Wharton Jones should be a physiologist and an ophthalmic surgeon, and to do him full justice it would perhaps be best if they had not met in the flesh. I undertook to write a short life of him without these qualifications, and without having known him intimately, simply because I was asked to do so by the Editorial Committee of the BRITISH JOURNAL OF OPHTHALMOLOGY.

He was indeed a familiar figure when I was a student, but this is a disadvantage, because it may make me emphasize his foibles at the expense of his great qualities. Medical students are poor judges of the characters of their senior teachers, and opinions formed at that impressionable time are hard to modify. Such as they are, however, they have their value, so I will begin by describing his appearance and saying what we thought of him in the seventies of the last century.

The admirable portrait shows, or suggests, as well as any description, his diminutive figure, clad in rather rusty broad-cloth, his quaint pallid face, piercing eyes, long flat nose and long upper lip, and the wisp of straight iron grey hair hanging down on each side from below his skull cap; and if you substitute for this a tall

silk hat and a very long overcoat for out-of-doors the picture is complete. Like his friend and colleague Robert Edmund Grant, the Professor of Comparative Anatomy, whose every day attire was a dress coat, he seemed to belong to an older period than the rest of our teachers, much older certainly than that of their contemporary Sharpey, and we called him—can you wonder?—"Mummy Jones."

In those days attendance on the lectures of the Professor of Ophthalmic Medicine and Surgery was not compulsory, so not many of us were familiar with his Scottish brogue which was stronger than might have been expected in one whose father was a Welshman and who boasted of his ancient English descent and of his old Hibernian kinsmen. And those who went found the lectures unattractive. They were read word for word from a complete manuscript of the course, just as much as could be got through in an hour without reference to the stage he had reached in the subject he was dealing with.

For my own part, I put off these matters for a day that never arrived, and I saw no more of him till, as a young assistant surgeon, I met him from time to time in the Board Room of the Hospital. There was then no retiring age, and he was about 70, but he was always ready for a long disquisition with a junior colleague on such unlikely topics as the special virtues of particular jams, or the superiority of his leather overshoes of Russian pattern to goloshes. Perhaps it was because he was by this time a very solitary man. His real life's work was over, and, when he reached his little home in George Street, Hanover Square, it was not to make or describe more epoch-making discoveries, or to compile laborious treatises or text-books, but to write counter-blasts against the Darwinian theory of evolution, or to enter into angry polemics about his grandmother's genealogy.

When he first came to London in 1838, he wrote from Newman Street, Oxford Street, but he must soon have moved to George Street. Probably his mother lived with him. She died there in 1862. No. 35 is the smallest of the small houses at the narrow southern end of what was once a fashionable street,* lined with noble mansions above St. George's Church, where it broadens out into half the width of Hanover Square. It is indeed a ridiculously small house—simply four little rooms, one above another, and a narrow staircase. If it ever had back rooms they were absorbed at least as long ago as 1760 by the continuation of a shop or house in Conduit Street. Here our lonely old bachelor lived with a poor married couple whom he provided with quarters in return for their domestic service.

*It was the place of assembly of the Four-in-hand Club. Lady Mary Wortley Montagu died at a "harpsicord house" in George Street in 1762. Richard Brinsley Sheridan lived there in 1803, Madame de Stael in 1813, and Phillips, R.A., 1805-1845.

The pedigree of which he was so proud, and which he studied with the same accuracy and persistence as he had devoted to the solution of scientific problems, was not his father's. That only goes back three generations to one Thomas Jones of Oswestry. It was that of his maternal grandmother, which he traced through Philipses and Ellistons to the middle of the sixteenth century, and by means of their more or less authentic ancestors, Aleston, Aliston, or Alyston, he went in fancy even further back than Domesday Book to an Essex Alestan, a freeman whose lands were confiscated at the time of the Norman Conquest.

Wharton Jones was the last representative of this ancient family, and he brooded over a common grievance, that money and heirlooms to which he seemed to have a sort of moral claim had passed away into another family. They had been inherited by his great aunt by marriage, who was a Whatman. The Whatmans were the well known Kent paper makers. Jones entreated James Whatman, courteously at first, to give him the portrait of Martha Elliston, his great-grandmother, but without success; and an acrimonious correspondence* went on for several years, which was printed, and, for all I know, published, as well as a letter to Ulster King of Arms and a paper in the "Herald and Genealogist." These should be studied by those who would appreciate all the sides of the character of this great little man who thought as much of a supposed sixth cousinship to Queen Victoria as of his discoveries about the circulation of the blood and inflammation.

Jones's paternal grandfather was a merchant and liveryman in London. His father, who was educated at Bridport, was first destined for the Army, but in 1782 obtained a position in the Custom House in Edinburgh. He married at the age of 38 in 1802 and, after a severe illness in 1804, retired on a pension and lived, for a few years in each, at St. Andrews, Stirling, South Queensferry, and Musselburgh, where he died in 1821. His second son, our Thomas Wharton, named after the Chairman of the Board of Excise, was born Nov. 28, 1808. He had two brothers and three sisters, all of whom I believe died unmarried.†

Of his childhood and youth no particulars are forthcoming except that he attended schools in the different towns to which his father migrated. His mother was a Scotswoman, Margaret

*The correspondence began in 1862 and became warmer and warmer till the climax in 1867. One thing that rankled was that Whatman claimed the picture as a family heirloom, another that he said his father had given Jones pecuniary assistance. Jones admitted that he had received two gifts of £50 forty years before, but pointed out that all the Philips money except £12,000 had gone to the Whatmans.

†His elder brother, Richard Eliston Jones, Lieut. H.E.I.C.S., died in 1828. The younger brother, Nathaniel Walton Jones, M.R.C.S., was a patient in University College Hospital when quite an old man, and we never heard of his being married. The three sisters died unmarried.

Cockburn, of Ayton Mains, Co. Berwick. He lost his father when he was 13 years old, and then all his surroundings were Scotch. It is thus easy to understand that in later life no one would have taken him for an Englishman. In spite of what he says in one of the Whatman letters there is no doubt that his father's circumstances, after resigning his appointment, were decidedly straitened.

On leaving school Wharton Jones attended first the arts classes at the University of Edinburgh and then went through the medical course in the same city.

In due course, when he was about 19 years of age, he became assistant to Robert Knox, the celebrated extramural teacher of anatomy. This was in the days when the comparative unattractiveness of the third Munro left plenty of work for the private teachers, and especially for Knox, who was not only a striking personality but an orator and master of words and phrases. It was a tragic period in Jones's life. He did not like to speak of it and it left behind a permanent shadow.

In 1826, when dissection was made compulsory for medical students, the difficulty of obtaining subjects became acute. Then there sprang up a "regular and legitimate though infamous craft of resurrectionists" (to quote from "The Times" of Jan. 1, 1829); and as you walk on the Calton Hill to-day, and look down upon the graveyard of the Canongate Church, you may still see the iron bars which were placed over the tombs to protect them from desecration. This lucrative business suggested to the villain Burke and his accomplice Hare the ghastly trade with which the name of Burke is always associated. Thirty or forty poor wretches were supposed to have been done to death by them and many of these were said to have been brought to Knox's rooms in Surgeons' Hall. His three assistants, Fergusson (afterwards Sir William), Jones, and Alexander Miller, had to make arrangements with Burke and Hare and pay over the money to them, and it was broadly hinted, after the trial, in "The Times," and in the Scottish papers, that Knox and his assistants knew too much. The "Caledonian Mercury" for example, said that an investigation should be held as to how the subjects were obtained "and in particular the students and assistants (during the last two sessions) of one gentleman, whose name has unfortunately been too much mixed up with the late proceedings, ought to undergo an examination as to the quarter whence bodies were procured, the state in which they were received and the manner in which they were dissected. . . . The present impression on the minds of the people is that one gentleman stands in the same relation to Burke that the murderers of Banquo did to Macbeth. This impression we believe and trust is ill-founded, but the fact of its existence, etc., etc." Unfounded it

was, of course, but the publicity of the trial and the horror throughout the country created a distressing situation for all concerned, especially for Knox, although his students did give him a gold vase as a token of their confidence in him. Jones, who was always extraordinarily sensitive, felt the public odium acutely at the time. It also affected him in later life when he became a colleague of his two Edinburgh friends, Robert Edmund Grant and William Sharpey, at University College, London, and all three were Fellows of the Royal Society; for Sharpey had been intimate with Knox and, it is said, contemplated a partnership with him, but, when the scandal arose, he joined in the hue and cry against him, while Grant and Jones supported him. This led to a coolness which subsequent events did not tend to diminish.

Grant (1793-1874) came to Edinburgh in 1820; Sharpey (1802-1880) obtained the Edinburgh M.D. in 1823; and Jones, who was the youngest of the three, was teaching anatomy there at all events from 1827 to 1829. Grant was appointed Professor of Comparative Anatomy and Zoology at University College (then the University of London) in 1827; Sharpey, Professor of Physiology in 1836, in succession to Jones Quain; and Jones was made the first Professor of Ophthalmic Medicine and Surgery in 1851. They were alike fortunate in having made extensive journeys on the continent, visiting the medical schools, as was the fashion of the time for those who were intending to devote their lives to the medical sciences, and when they were elected to the Royal Society—Grant in 1836, Sharpey in 1839 and Jones in 1840—there was another field in which to meet, the arena of pure science, not always free from the dust of conflict.

The Secretary of the Royal Society at this time was Peter Mark Roget (1779-1869), and he had held the appointment since 1815. His energy was unbounded, and so apparently were the fields of his enquiries. To the lay world he is best known as the author of Roget's "Thesaurus of English Words and Phrases." For us his most interesting work is the Bridgewater Treatise for 1834, on "Animal and Vegetable Physiology considered with reference to Natural Theology," because it was said that most of his facts were obtained by attending a course of Grant's lectures, which always rankled in Grant's mind, and in that of his friend Jones.

The endowment for the Bridgewater treatises was provided by the eccentric 8th Earl of that name.* With a similar object the Actonian prize of the Royal Institution was founded by Mrs. Hannah

*Right Hon. and Rev. Francis Henry, 8th and last Earl of Bridgewater, who died in 1829. He was a learned man, but was more than eccentric. He was a bachelor; Prebendary of Durham; lived in Paris, surrounded by dogs and cats dressed like human beings. There were in all nine Bridgewater treatises, to illustrate "the Goodness of God as manifested in the Creation."

Acton, of Euston Square. It was given septennially for the best essay illustrating the "Wisdom and Beneficence of the Almighty in the various departments of Science." Jones obtained the second award in 1851. He illustrated the subject by means of the sense of vision, in a simple little essay, explaining, in popular language, the anatomy and physiology of the eye of man and other animals, and assuming and constantly stating that the perfection of the eye is a proof of the Wisdom and Beneficence of God. It is interesting to note that at this time he did not know the true use of the ciliary muscle.

Roget was the first Fullerian Professor of Physiology* at the Royal Institution in 1833; Grant followed him in 1837; and, after the chair had been held by Rymer Jones, W. B. Carpenter and Gull, Wharton Jones was chosen in 1851. He evidently thought a good deal of this professorship as he mentioned it on the title pages of many of the books he published afterwards.

Wharton Jones was a staunch defender of religious orthodoxy throughout his life, as became the winner of the Actonian prize. Grant, on the other hand, if he ever held such views, had abandoned them when he was our teacher in the seventies of the last century. He was then the friend of Darwin, with whom he worked, and we students used to listen with a sort of guilty pleasure to his satirical references to Providence and other matters then almost regarded as too sacred for enquiry. Grant died in 1874. If he had lived two years longer he would surely have smiled at the attitude taken up by Jones in a book of about seventy pages entitled "Evolution of the human race from apes, and apes from lower animals, a doctrine unsanctioned by science." It is an uncompromising attack upon the theory of evolution founded upon the following postulate without which his whole argument falls to the ground. "In the natural history of an organism we recognise something more than the manifestation of physical and vital forces—physical forces as the attribute of the machinery—and vital forces as the mainspring of its action. We recognise in the aggregate plan a Divine Idea, and in the fulfilment of the purpose an Almighty Hand. From the commencement of its development the body of an animal is in a continuous process of change, and yet it remains unchanged in plan. The transformations merely run in a circle, so that there is no progressive evolution; but the different races, so long as they exist, continue to retain each its own characters." After a caustic criticism of Haeckel and Darwin, he concludes with these words: "We thus see that EVOLUTION,

*Founded by John Fuller, of Devonshire Place (1756-1834), for promoting by means of lectures or otherwise the cultivation and improvement of that science and particularly that branch thereof called comparative anatomy. Many very distinguished men have held the chair.

from beginning to end, is an *unverified* and *unverifiable hypothesis.* The scheme may, indeed, be entertained, as it has long been, more or less, as suggesting inquiries into the natural affinities of organised beings; and in this respect I have just eulogised Haeckel's phylogenetic disquisitions. But when the doctrine is promulgated as a kind of *new revelation in science,* and obtruded on us almost as an *article of faith* in a propagandist and intolerant spirit, we are roused to repel the attempted encroachment. Our present advanced knowledge in Natural Science has not rendered the idea of Evolution a bit more probable than it was in former times. And it must be firmly denied that the conceit of Natural Selection by Survival of the Fittest has, in any degree, imparted to the theory more substantial body than it had before, or raised it to the scientific position which Darwin and his followers claim for it."

This passage is a good example of Jones's style and a clear reflection of a part—and not the least important part—of his mental outlook. It may be objected that it was written in advanced middle age, when the inward eye is apt to lose its power of accommodation, and that it is unfair to generalize from such a late pronouncement. But his earlier writings show that it was no new thing for him to indulge in severe and sometimes impatient criticism of the work of others, and that nothing ever shocked him more than what he considered to be fallacious logic or careless observation. That is why it has been introduced here, so that the reader may appreciate this side of his character before we proceed to the discussion of the serious work of his life.

If it had not been for the Burke and Hare tragedy one guesses that Jones would not have left Edinburgh when he did. But no doubt he was glad enough to escape from it on the first favourable opportunity. Accordingly in 1829, or perhaps a little later, he went to Glasgow, where he was closely associated with Dr. William Mackenzie, the well known ophthalmic surgeon, and also with Dr. Harry Rainy, afterwards Professor of Forensic Medicine.

He helped Mackenzie with his widely-read text book,* supplying, amongst other contributions, the frontispiece, which shows that he was already a very skilful draughtsman. All this confirmed, if it did not originate, his bent towards the practice of ophthalmic surgery. Here, like some other clever scientific men, he found time to devote to the drudgery of writing a manual of pharmacology.

After five or six years in Glasgow he moved to Cork, and stayed there from 1835 to 1837, engaged in medical practice, but devoting himself specially to the treatment of diseases of the eye and ear.

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* "Practical Treatise on Diseases of the Eye," by William Mackenzie, Lond., Longmans, 1830. Second Ed., 1835. Third (with section by Jones), 1840. Fourth 1854. French trans., 2 vols., Paris, 1856-7.

The year 1837 was his "Wanderjahr,"—rather late it may be thought, for he was now 27. He visited most of the important medical schools of the continent, and we hear of him addressing, in French, a meeting of naturalists and physicians at Prague, on the origin of the chorion.

In 1838 he came to London as Lecturer on Anatomy, Physiology and Comparative Anatomy at the Charing Cross Hospital, then quite a small medical school, but always having some well known men upon its staff. He held this post for fourteen busy years, to his own satisfaction and that of his colleagues and students. Amongst the latter was Huxley, who spoke in the highest terms of the method and quality of his physiological teaching. "I do not know," he said, "that I ever felt so much respect for a teacher before or since." His lectures were apparently very different from those delivered at University College later in life. This is Huxley's description of them: "Singularly dry and cold in form, they were admirable in logical construction, and full of knowledge derived from personal observation and wide reading. The true *lumen siccum* of science glowed in every proposition which fell from the lips of the pale adust little man as he stood with downcast eyes and fingering his watch chain, at one corner of the table. He never had any notes, but the lectures would have read perfectly well if printed straight off. I used to wonder at and envy his 'facility,' not having learned in those days what price has to be paid for easy speaking of that quality."* Another of his students, Sir Joseph Fayrer, of Indian fame, bore witness to his earnest, enthusiastic and impressive manner of imparting knowledge and to his good personal influence upon the students.

Jones came to London with a reputation already made. His writings were well known to the leading physiologists and comparative anatomists in this country and abroad, with many of whom he was personally acquainted. He had published a number of papers on human and comparative anatomy in the Proceedings of the Royal Society and in various Scottish, Irish, and other journals. Some of the earliest were on the eye, but perhaps the most important were those which described his investigations into the ova of women and mammiferous animals as they exist in the ovaries before and after impregnation. We must bear in mind that the ovarian ovum of man and the mammalia was first discovered by von Baer in 1827, not so very long before the time of which we are speaking.† Jones was one of the first‡ to discover the real germinal vesicle in the human and mammalian ovum, and to demonstrate the nature and significance of that body. This was in

Brit. Med. Journ., 1891, Vol. II, p. 1176.

†"Epistola de ovo Mammalium et Hominis genesi." Leipzig, 1827.

‡The other discoverers were Valentin in Germany and Coste in France.

1835.* He worked at this subject at least as late as 1843, when he published an elaborate criticism of the work of several foreign investigators in the form of a Report in the "British and Foreign Medical Review." †

In addition to these investigations on the ovum, his scientific work consisted chiefly of observations on the state of the blood and the changes that occur in the blood during inflammation and the healing process, and on the structure and development of the blood corpuscles. In these he made and described many new discoveries, amongst others that of the amoeboid movements of the white corpuscles,‡ now such a familiar phenomenon that we scarcely pause to enquire about its discoverer.

In the meantime he was continuing his study of the eye and ear, and doing a certain amount—probably not much—ophthalmic and aural practice which resulted in at least one scientific paper—"Observations on Single Vision with Two Eyes"‖—and two practical works. The first of these was an article on "Diseases of the Ear, and Hearing" in the "Cyclopedia of Practical Surgery,"§ which was also printed as a separate book in 1841. Beyond the fact that the examination of the external ear was made by direct sunlight with or without a speculum and that his account of aural polypi was quite vague and wrong, the teaching was for the most part just what was given to students thirty years later. The other practical book was "A Manual of the Principles and Practice of Ophthalmic Medicine and Surgery."¶ It was one of a series of stumpy thick octavo manuals of unattractive appearance brought out by John Churchill, a series very familiar to many generations of students. The favourite text book on the eye at this time was Mackenzie's,** to which reference has already been made. Jones's Manual proved to be acceptable; a second edition appeared in 1855 and a third in 1865. I have the first and third now before me. The first is remarkable as containing a long account of inflammation in general; he said he

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*"On the ova of women and mammiferous animals as they exist before and after impregnation; and the discovery in them of a vesicle analagous to that described by Prof. Purkinje in the mature egg of the bird." *Roy. Soc. Proc.* III, 1835, pp. 339-340.

†"Report on the ovum of man and the mammifera before and after fecundation." *Brit. and. For. Med. Rev.*, No. XXXII, 1843, *Forbes Med. Rev.*, XVI, 1843, pp. 513-557.

‡"The blood-corpuscle considered in its different phases of development in the animal series." Mem. i. Vertebrata. Mem. ii. Invertebrata. Mem. iii. Comparison between the blood-corpuscle of the vertebrata and the invertebrata." (1845). *Phil. Trans.* 1846, pp. 63-68, 89-102, 103-106. *Froriep. Notizen* xxxvi. 1846, col. 38-40; Silliman, Journ. i., 1846, pp. 128-129.

‖ *Roy. Soc. Proc.* iv., 1840, pp. 248-249.

§ Ed. W. B. Costello. 4 vols. London. Taylor and Greening, 1861 ("Dis. of Ear and Hearing," in vol. 2, pp. 1-55. "Ectropium," in vol, 2, pp. 64-73.)

¶ John Churchill, 1847.

** See p. 103.

could not resist the opportunity which the subject offered of illustrating the general doctrines of pathology, especially those of inflammation. It is in this respect the work of a scientific pathologist rather than that of a practical surgeon. There are some beautiful hand-coloured steel engravings and a number of excellent wood cuts from his own drawings. It marks the border line between old and modern ophthalmology, for no mention is made of the ophthalmoscope. The third edition* has swollen from 570 to over 800 pages. There are more illustrations, including many coloured wood-cuts; the elaborate account of inflammation has disappeared; there is now a full description of the ophthalmoscope, at the end of which is this note, "Here I ought not to omit stating that in the spring of the year 1847, Mr. Babbage† showed me the model of an instrument which he had contrived for looking into the interior of the eye. The reflector was a small, plain glass mirror, with a part of the silvering rubbed off to look through." Elsewhere we read that "the ophthalmic surgeon to whom Babbage showed his instrument did not appreciate its value." If he had done so Jones would have anticipated Helmholtz's discovery of the ophthalmoscope (in 1851) by four years.

In order to identify himself completely with London, Jones took the membership of the Royal College of Surgeons in 1841; and when the new class of Members who were to be called Fellows was instituted by the Charter of 1843, he was included amongst those who were elected in 1844, chiefly from members of the staffs of London and provincial hospitals and from the fighting services.

In 1851 it was decided to institute a Professorship of Ophthalmic Medicine and Surgery at University College, then, as always, in the forefront of educational advance, and with already a twenty-five years' record of restless energy and success. The chair was given to Jones, and he was also made Ophthalmic Surgeon to the hospital, a post which involved chiefly out-patient practice, but included the charge of a few beds. He held both these appointments for thirty years. At the time he entered upon them he was doing scientific work of a higher quality than at any other period of his life. He must have found University College congenial for these investigations. There he was surrounded by the devotees of pure science, and the spirit of scientific enquiry prevailed amongst the members of the hospital staff.

In 1850, the year before his appointment, he had published, in the "Guy's Hospital Reports," his Astley Cooper Prize essay "On the State of the Blood and Bloodvessels in Inflammation, as ascertained by Experiments, Injections, and Observations under the Micro-

*John Churchill, 1865.

†Charles Babbage, F.R.S., 1791-1871, famous for his "Table of Logarithms" and his Calculating Machine. See *Brit. and For. Med. Chi. Rev.* for Oct., 1854.

scope." It occupies 100 pages, and is based on many original observations. His own conclusions and those of other physiologists are freely discussed. There are nine beautiful coloured plates and many woodcuts.

After further investigations this was supplemented, in 1852, by a paper in the Transactions of the Royal Medical and Chirurgical Society,* describing the phenomena of inflammation as it occurs in the bat's wing, his previous observations having been confined to the web of the frog's foot. This was the work that largely occupied his attention during the early days of his professorship. During its progress he wrote another paper on "Blood-corpuscle-holding Cells."†

At University College, although perfect peace did not by any means always prevail amongst the professors, Jones's originality and accuracy were appreciated by most of his colleagues. Sir William Jenner is said to have spoken of him as "one of the greatest Englishmen who ever lived"—surely rather exaggerated praise. His influence upon students of an enquiring mind was generally acknowledged. Lister, who for a time was his clinical assistant, admitted the inspiration. When he went abroad he took introductions from Jones to foreign professors, and when he was himself engaged in the study of inflammation, his method of investigation was clearly modelled upon that of his teacher. Lister always spoke and wrote of Jones with respect, even when he differed from his conclusions. It is therefore sad to read, in one of Jones's latest writings,‡ a string of bitter remarks about his pupil, accusing him of misrepresentation, inaccuracy of observation and scientific incompetence. I quote one sentence which hints at the old friendship, while it expresses the bitterness of an old man—he was then 83—who thought that his scientific brothers had misunderstood or overlooked his work and had bestowed the palm upon the unworthy. But it must be remembered that in the same book he is equally severe upon Cohnheim, Schiff, Michael Foster, Burdon Sanderson, McKendrick, Virchow, Savory and Horsley. The fact is that when Jones had reached a certain point in his career he stopped and seemed unable to put up with the discoveries of his successors. Here are his actual words: "This and such-like blundering strictures which Sir Joseph Lister (under the misguiding auspices of his Professor of Physiology, the late Dr. Sharpey, who was at the same time Physiological Secretary of the Royal Society) has levelled against my Essay, 'On the State of the Blood and the

*Med. Chir. Soc. Trans., XXXVI., 1853, pp. 391-402.

†(Review) Brit. For. Med. Chi. Rev., XI., 1853, pp. 32-38.

‡"Report on the state of the blood and bloodvessels in inflammation and on other points relating to the circulation in the extreme vessels, etc." Baillière, Tindall and Cox, 20 and 21, King William Street, Strand, 1891.

Blood-Vessels in Inflammation,' betrays a neglect of research by observation of phenomena in their sequence and correlations and an illogical proclivity to hasty excogitation. Lister had been a pupil of my class in University College, and had served temporarily as my ophthalmic assistant at the hospital, having, at his own request, obtained permission from me to do so. That Sir Joseph had been studying my Papers on Inflammation with great diligence was evident from the pertinence of his inquiries in conversation with me respecting my observations, in order to obtain by word of mouth further elucidations of the subject. So intent, indeed, was he in his inquiries that he, one day, accompanied me in my walk to the Regent's Park after the hospital visit, *cross-examining* me all the way!"* Which seems a natural and proper thing to do. It conjures up a pleasant picture of the eager young surgeon from Edinburgh and the equally earnest professor pacing the walks of Regent's Park and picking one another's brains about these knotty problems.

Only two short letters—or rather notes—from Jones to Lister have been preserved. The following is interesting from its quaint formality, and as showing that their friendship had not cooled in 1855; but this was two years before the reading of Lister's paper which gave so much offence. It begins "My dear Sir." Lister was hardly out of his pupilage:—

"35, GEORGE ST., HANOVER SQ.,
May 17th, 1855.

MY DEAR SIR,

I am labouring under an attack of influenza and am compelled, therefore, with great reluctance to forgo the pleasure which I should have had in dining with you and your father.

With my best respects to your father,

I remain, My dear Sir,
Yours very truly,
T. WHARTON JONES."

In trying to estimate the importance of Jones's work on the blood, the circulation and inflammation, we must not forget that there were many toilers in this field, and that it was no novelty to examine the circulation in the web of the frog's foot; this was the method adopted by Kaltenbrunner, of Munich, who died in 1826, and possibly by some of his predecessors. Amongst the contemporaries of Jones were J. Thomson, Wilson Philip and his friend Charles Hastings, James Paget, Lister and others. Each contributed his quota, one larger, one smaller. Jones's was one of the largest. Lister's was unique because he confined his attention to the very earliest stages of inflammation, a period which had been neglected by all previous observers. There was a good deal of criticism amongst some of these pioneers, and far too many disputes about priority—a sad waste of energy and time; especially when one

* *Loc. cit.* p. 39.

bears in mind that they knew nothing of the influence of micro-organisms on inflammation, or the varieties and functions of leucocytes, or the value of the clinical thermometer. Hence most of their writings have only an academic interest for us. What, for example, can we make of such statements as the following, taken from near the end of the Astley Cooper Prize essay: "That the increase in the quantity of fibrin is directly owing to the inflammation, appears from the fact pointed out by Andral and Gavarret, that when inflammation supervenes in the course of typhoid fever, the fibrin, from being less in quantity than natural, becomes greater."

Whilst he was working at the circulation and inflammation, Jones made two interesting discoveries in comparative physiology.

The first of these was that the veins of the bat's wing are furnished with valves and are endowed with rhythmical contractility, and that the onward flow of the blood is accelerated by each contraction.* These phenomena were observed in the course of a methodical preliminary study of the distribution, structure and endowments of the arteries, veins and capillaries. The contractions occur on an average ten times a minute and are to be distinguished from the tonic contractions of the arteries, which tonic contractions did not, as Paget had said was the case, occur in the veins.

The second discovery was that of the function of the caudal heart of the eel. The paper in which it was described dealt also with the structure of the muscular coat of the veins of the bat's wing.† Like most of his papers it is beautifully illustrated from one of his own drawings. This caudal heart was discovered by Marshall Hall (unless Milne Edwards was right in saying that it was known to Leeuwenhoek (1632-1723). Marshall Hall thought that it was a blood-propelling heart. Jones proved that it was a lymphatic heart, though he could not make out how the lymph entered it. He cleverly explained the appearance of blood being propelled in successive drops along the caudal vein by showing how the drops of transparent lymph which were shot into the blood stream by the contractions of the caudal heart gave rise to the deception.

Now that we have traced Jones's career to the time when he was a recognized authority on ophthalmology in London, it is appropriate to pass in review what he did for the advance of that science. A

*_Phil. Trans._, received November 20, 1851, read February 5, 1852, with two appendices, received December 11, 1851, read February 5, 1852, and received May 10, 1852, read May 13, 1852.

†"Microscopical characters of the rhythmically contractile muscular coat of the veins of the Bat's wing, of the lymphatic hearts of the frog, and of the caudal heart of the eel." _Roy. Soc._, received November 26, 1867, read January 8, 1868. _Phil. Trans._, CLVIII, 1868, pp. 675-683. _Roy. Soc. Proc._, XVI, 1868, pp. 230-231.

fair general idea of this may be obtained from a summary of his published writings on matters connected with the eye; but it is confessedly imperfect, because his letters and short communications to journals were so many and so scattered that it would be almost impossible to make a complete list of them. They are placed in chronological order.

Between the time of leaving Edinburgh and coming to London there were at least five scientific papers.

"Description of the eye of the Cuttlefish," 1831.

"Notice relative to the *pigmentum nigrum* of the eye," 1833.

"On the motions of the pupil," 1834.

"On the retina and pigment of the eye of the common Calamary," 1836.

"On the so-called choroid gland or choroid muscle of the Fish's eye," 1838.

Whilst he was teaching anatomy, physiology, and comparative anatomy at Charing Cross Hospital there appeared:

"Observations on single vision with two eyes," 1840.

"A manual of Ophthalmic Medicine and Surgery," 1847.

During his professorship at University College the manual passed through one French and two English editions, and he also published:

"The Actonian Prize Essay," 1851.

"A Report on the Ophthalmoscope," 1854.

"Defects of Sight," 1856.

"A Catechism of the Medicine and Surgery of the Eye and Ear," 1857.

"Analysis of my sight with a view to ascertain the focal power of my eyes for horizontal and for vertical rays and to determine whether they possess a power of adjustment for different distances," 1859.

"On the invention of stereoscopic glasses for single pictures with observations on the stereoscope and stereoscopic vision," 1860.

"Failure of sight from railway and other injuries of the spine and head," 1869.

We need not dwell long upon the purely anatomical and physiological papers of his early manhood. They were good examples of the thoroughness and accuracy that characterized all his original scientific writings. The short paper on the so-called choroid muscle was only a confirmation of observations made by Albers in 1806. With regard to the motions of the pupil it may be noted incidentally that, though he did not, any more than his predecessors, Kölliker, Schiff and others, succeed in making out the precise musculature of the iris, he did observe, figure and describe to his class plain muscular fibre about 1843, that is, five years before Kölliker announced his discovery of this tissue. Jones obtained his

specimens from the walls of the intestines, stomach, oesophagus, uterus and other organs. This, as well as other original observations of Jones on involuntary muscular fibre are recorded by Lister in his paper on the contractile tissue of the iris.* It is worth noting that Lister, writing in 1853, owned that, though it was easy to prove the existence of the *sphincter pubillae*, he had never been able to demonstrate the *dilatator* to his satisfaction.

We have already dealt with the manual (p. 105), which was his chief contribution to ophthalmology whilst he was at Charing Cross Hospital. The paper on single vision with two eyes† was very short and of no great importance; he returned to this subject again when writing on the stereoscope.

His first publication after coming to University College was the simple popular Actonian prize essay (p. 101).

This was followed in 1854 by a "Report on the Ophthalmoscope,"‡ three years after its invention had been announced by v. Helmholtz. There was first a summary of the observations that led up to the discovery, a brief description of the instrument and a very few clinical notes. Neither here nor in Germany was it claimed that therapeusis had so far gained anything from the ophthalmoscope, but its value in diagnosis was strongly insisted on.

Jones was fond of writing reports: not always reports to any particular body, but reports to the world in general. This on the ophthalmoscope appeared in a review. The reader will recall another on the mammalian ovum (p. 104) and there were two others on inflammation.

He also had a proclivity for writing thin, small octavo, semi-popular books, uniform in size with the Actonian prize essay.

One of these "On defects of sight, their nature, causes, prevention and general management," ‖ appeared in 1856. It is difficult to imagine for whom it was intended. In the preface he says that, being impressed with the fact that much of the defective sight and blindness we meet with is the result of disease, either preventable altogether or, at least curable if taken in time, it had occurred to him that a small volume containing some guiding principles relative to the cure and preservation of the sight would be useful. "Accordingly," he continues, "I have thrown together, in the following pages, such observations on the subject as appear to me calculated to answer the end in view." Rather more than twenty pages at the beginning are devoted to warnings against common

* Lister's Collected Papers, vol. I. p. 1 (foot note), p. 3, p. 8. *Quart. Journ. Micr. Sci.*, vol. I (1853), p. 8.

† *Roy. Soc. Proc.* IV, 1840, pp. 198-199.

‡ *Brit. For. Med. Chi. Rev.*, XIV, 1854, pp. 549-557.

‖ John Churchill.

dangers to the eyes and about the same amount at the end of the volume; but the bulk of it is an epitome of the manual. It seems too deep for the general reader, but too superficial for the practitioner or even the student.

The same criticism applies to a companion volume which was published the following year "A Catechism of the Medicine and Surgery of the Eye and Ear"*; but this was avowedly meant "for the clinical use of Hospital Students." "Question and answer," he says, "being calculated to bring forcibly and briefly to mind at the moment the salient points of a subject, I have drawn up this Catechism in the hope of aiding the student in his clinical observations at the hospital;" and he adds "for more systematic study in the closet, during leisure half-hours, I would recommend my 'Principles and Practice of Ophthalmic Medicine and Surgery.'" One example will be enough to show what the catechism is like.

"What is the best local treatment for granular conjunctiva?

Scarification of the affected conjunctiva every second or third day, and immediately thereafter the application to it of some strong salve, such as the red precipitate (℥j.—℥j.).

Is not blue stone much used as an application in granular conjunctiva?

Yes, and abused also; the result too often being the destruction of the palpebral conjunctiva, as well as the granulations."

We do not know whether this was a successful venture, nor whether it was his own initiative or the persuasions of his publisher which made him write another catechism the following year on a much more ambitious subject, "A Catechism of the Physiology and Philosophy of Body, Sense, and Mind, for use in Schools and Colleges and in Private Study."† Its object was to encourage the teaching of the rudiments of the physiology of the body, in conjunction with the philosophy of the mind, in the curriculum of general education. Not only from the hygienic point of view and because prevention of disease is better than cure; but chiefly because such a study affords a good mental training and "prepares us to observe correctly, and to appreciate at their just value, facts concerning ourselves and the relations in which we stand to the world around us."

It was rather a tough morsel for boys and girls at school, as may be judged from this extract from the introduction:

"Sum up what you have been saying of the death and reproduction of plants and animals.

Though plants and animals enjoy only a temporary existence as individuals, their existence as races is of indefinite duration; their temporary existence, as individuals, being maintained by nutrition—their indefinitely prolonged existence, as races, secured by reproduction. In short, though the individual dies, the race continues to live.

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*John Churchill, 1857.

†John Churchill, 1858.

You are here speaking in reference to the present geological epoch, are you not?

Yes; for the extinction of races and the creation of new have been shown by geologists to have repeatedly taken place in former phases of the earth's development.

Extinction of races and creation of new! But is there not reason to believe, etc., etc." And then follows the proper orthodox view of the day about Darwin and his theories, which, as we know, he held with great tenacity and even impatience.

Of more value than these catechisms was a short paper which appeared in the Proceedings of the Royal Society in 1860 with the title: "Analysis of my sight with a view to ascertain the focal power of my eyes for horizontal and for vertical rays and to determine whether they possess a power of adjustment for different distances.* He himself was myopic, and what he calls "distigmatic not monostigmatic." In this paper he deals with the symptoms, not the pathology of astigmatism.

He evidently thought that he had no "adjusting power in his eye," and he doubted about Müller's experiment with two pins; but he owned that, if anyone can corroborate it he must have adjusting power in his eye. "I have never succeeded," he says, "in seeing the phenomenon myself." He appeals to others to carry out similar experiments on themselves and to report the results of their observations to him.

Jones described astigmatism under the heading "Cylindrical Eye" in the first edition of his Manual (1847), and in "Defects of Sight" (1856). In the third edition of the Manual (1865) he calls it "Distigmatism." Here he tells of the well-known observations of Dr. Thomas Young in 1801, and of Mr. Airy, the Astronomer Royal, in 1827. His own contribution to the subject appears to have been to show that the shape of the cornea really was accountable for the defect of vision, as Airy had suggested it might be, and to prove that a moderate degree of astigmatism is "if not the rule of sight, at least of very common occurrence."

In the same year, 1860, he published a short paper or booklet "on the invention of stereoscopic glasses for single pictures with preliminary observations on the stereoscope and on the physiology of stereoscopic vision."† Five chapters are devoted to a description of the stereoscope and the physiology of vision, especially that of single vision with two eyes and stereoscopic vision, and to a discussion of the relief or intaglio of objects as observable in Nature with the two eyes as compared with that in which their reproductions are commonly made to appear in the stereoscope. In the last short chapter comes the pith of the paper: a description

*Roy. Soc. Proc., X, 1859-60, pp. 380-385.

†John Churchill.

of some concave cylindrical glasses, cunningly devised in order to give the observer the stereoscopic effect when looking with both eyes at a picture. The first experimental lenses he ground himself out of amber; the finished article was the work of a lapidary. The result was more interesting than practical. No one but a scientific enthusiast would arm himself with such a pair of spectacles before visiting a picture gallery, or use them when he arrived. In describing their effect, Jones owned that he was chiefly relying on his own experiences. He added, however, that most persons who tried them agreed with him. But there were evidently many exceptions. "One gentleman exclaimed, 'But should there not be two pictures?' Other persons, unable at first to realize the effect, have, after a little observation, perceived it, and declared that the 'picture looked more natural.' Other persons again, however, taking their idea of stereoscopic effect literally from the exaggerated appearances in the stereoscope, have declared that they could perceive no such effect at all."

Nine years passed after the publication of this paper without any contribution being made by Jones to ophthalmology. He was occupied, as we have seen (p. 109), with caudal hearts and physiological obscurities. In the meantime great and increasing attention was being directed to the remote effects of railway injuries, and a wide field was thus opened for speculation by doctors and for wrangling in the courts of law. The general public, the insurance companies, the railways, and the lawyers were chiefly interested in the claims for compensation and the notoriously frequent cases of malingering. The doctors, while equally keen about the detection of fraud, were honestly trying to discover how a shake-up in a railway accident caused—if it did cause—the bizarre combination of symptoms complained of by some of the victims. They were handicapped in three ways; first, they had a very imperfect knowledge of the nature of "hysteria" and the protean forms it can assume; secondly, their acquaintance with the physiology and pathology of the nervous system was inadequate; and, thirdly, they had not shaken off the love of speculation that they had acquired by inheritance, and could not help guessing at the answers to questions of which it would have been far better to acknowledge their ignorance. The great advances in our knowledge which have been made in the last fifty years should make us lenient critics, especially when we reflect that, even to-day, the most experienced observers are sometimes baffled by imposture, though the part of the malingerer is much less easy to play and less profitable than it used to be.

Foremost amongst the authorities on railway accidents, and consequently a frequent witness at trials was the senior surgeon to University College Hospital, Mr. (afterwards Sir John) Erichsen,

and it was natural that he should appeal to his colleague Jones to explain, if he could, the anomalous signs and symptoms complained of by those who had been involved in railway accidents. Erichsen was the inventor of the unfortunate phrase "Railway Spine," which, being readily caught up by the public, produced, by suggestion, innumerable temporary backaches, and must have cost the insurance companies thousands of pounds. He also wrote a little book in 1866 on railway and other injuries of the nervous system and, I cannot doubt, inspired the next book by Jones which we have to consider. "Failure of sight from railway and other injuries of the spine and head, its nature and treatment with a physiological and pathological disquisition into the influence of the vasomotor nerves on the circulation of the blood in the extreme vessels."*

The title and still more the preface prepare the reader, after what he has already heard of our author's peculiarities, to find that the greater part of the book is occupied with disquisitions on general pathology and physiology. Jones could not resist the opportunity offered by having to write a book on a subject of the day without going over the old ground and restating his views about the circulation in the extreme vessels, inflammation, thrombosis and embolism; and, indeed, chapters ix to xiii give in the space of about ninety pages a useful and detailed compendium of all his work on these subjects. For this he offers the following excuse. "The points treated of in the five preceding chapters have so significant a bearing on our subject, that I have not considered it too much to dwell on their elucidation at the length I have done, the more especially as in the case of certain of them, great misconception, it has been shown, prevails. It is surprising, indeed, to see that while the mechanism of the circulation through the heart and great vessels is so well known, the mechanism of the circulation in the extreme vessels is really imperfectly understood, notwithstanding that the subject is one of fundamental importance in pathology as well as in physiology. In the pathology of inflammation, especially, we have seen what an important link in the chain of processes the state of the blood and blood vessels forms."

At the end of the book he returns to the subject in an appendix "comprising an additional chapter on inflammation," the object of which is summed up in the concluding paragraph: "While thus repudiating Professor Virchow's view of inflammation [proliferation of leucocytes], so remarkable for its extremeness in one direction, Dr. Cohnheim, it appears to me, promulgates a view of the subject [transmigration of the white corpuscles], as remarkable for its extremeness in the opposite direction."

This does not, however, exhaust the list of purely scientific

* James Walton, London, 1869.

matters treated of in the book. Much of the remainder is devoted to such questions as disturbances of the circulation in the optic apparatus, the movements of the pupils and the action of drugs, so that there is comparatively little space left for the special discussion of railway and other injuries. And, when the subject is reached, it must be owned that the way in which it is treated is disappointing. Less than two dozen cases altogether are reported, and these in an imperfect way both in respect of the histories supplied by the patients, and the physical examination by the doctors. The experience of the late war makes the comparison between "shell-shock" and "railway-spine" inevitable; and one closes the book with the feeling that neurasthenics and hysterical folk must have excited in Wharton Jones and Erichsen more interest and sympathy than was good for them, or fair to those from whom they were seeking compensation.

This treatise has been dealt with at some length because it is the last of any importance that Jones wrote upon the eye. And also because it shows that, at the age of 61, he had already, at least as far as ophthalmology is concerned, ceased to advance, unless it were, to use his favourite word, in the way of excogitation. And yet he would have thought it impertinent and unjust to speak of him as an excogitator, for his motto for the preface is this Baconian instruction, "Nil fingendum, nil excogitandum, sed inveniendum quod Natura ferat, quod Natura faciat."

And, in his younger days at least, this was the principle on which he worked. It was indeed his guiding principle in later life, although he may at times unconsciously have departed from it. It was the principle which made his teaching an inspiration to the student who was bent on acquiring knowledge, but tedious and unintelligible to those who were only gaping to be crammed. "His method," to quote Sir John Tweedy, "was that of observation, experimentation and verification. When questioned by pupils, he did not return a mere didactic answer: his maxim was 'let us look and see.'"*

Sir John Tweedy knew him better than any of his colleagues or pupils; we may, therefore, before leaving the subject of Jones's contributions to ophthalmology, again quote from the obituary notice which he contributed to the "Lancet." Speaking of Jones as an operator, Sir John Tweedy says that he was "not showy or dexterous in the narrow sense of the term, but he was successful as judged by results." He goes on to say that amongst other additions which he made to our knowledge was his explanation of astigmatism and adds that he was one of the first (if not the first) to observe the frequent association of retinitis pigmentosa with deaf-

* *Lancet*, 1891, vol. 2, p. 1256, November 28.

mutism and other neurotic disorders; and he continues—"In the course of his investigations and experiments with calabar bean he noticed the beneficial action of the local application of this drug in some cases of acute glaucoma before the special therapeutic properties of this drug in glaucoma had been observed, so far as the writer of this notice is aware, by any other person. His explanation of the *modus operandi* of calabar bean in this disease was faulty, but the observation was well-founded and correct."

(To be concluded)

NOTES ON THREE CASES OF ACQUIRED ASTIGMATISM ASSOCIATED WITH MEIBOMIAN CYSTS

BY

ARTHUR W. ORMOND, C.B.E., F.R.C.S.,

LONDON.

Mrs. H., aet. 49.—Came complaining of loss of sight in L.E. On examination, I noticed the presence of a Meibomian cyst in the left upper lid.

Note by Mr. McGillivray made three months earlier.

External appearance, normal. Pupils, normal. Ophthal., negative. No cyst of lids. R.V.=6/5 freely. L.V.=6/5 partly $\bar{c}$. + 0·25 D. cyl. V.=6/5. (Nothing unusual to record.) General health excellent.

30 September, 1919.—R.V.=6/5. L.V.=6/18 incorrectly. On retinoscopic examination, a whorled shadow was noticed, with strong plus shadows. Vision of L.E. was improved to 6/6 by $\frac{+ 2 \text{ D. sph.}}{+ 5 \text{ D. cyl. vert.}}$ The cyst having been successfully dealt with, the vision was found a day or two later to be 6/5 without any glass, and the patient no longer complained of defective vision.

J. W., aet. 64.—Came complaining of gradual failure of sight in L.E. Was wearing R.E. + 2 D. sph., L.E. + 2.5 D. sph. ordered in New Zealand. Had a Meibomian cyst in the left upper lid.

14 September, 1920.—R.V. 6/9 $\bar{c}$ −0·5 D. cyl. vert. = 6/5. L.V. 6/24 $\bar{c}$ $\frac{+ 1.5 \text{ D. sph.}}{+ 2 \text{ D. cyl. down and out } 160^{\circ}}$ =6/9 some. Irregular astigmatism by retinoscopy. Cyst incised.

1 October, 1920.—R.V. $\bar{c}$ −0·5 D. cyl. vert. = 6/5. L.V. $\bar{c}$ +1.25 D. cyl. down and out = 6/5.

Patient remarked on the disappearance of his symptoms in the interval.

E. C. S., aet. 55.—Complained of failure of sight in right eye. R.V. 6/24 $\bar{c}$ $\frac{-1 \text{ D. sph.}}{-1 \text{ D. cyl. hor.}}$ = 6/18 not improved. L.V. 6/12 $\bar{c}$ $\frac{-0{\cdot}5 \text{ D. sph.}}{-0{\cdot}75 \text{ D. cyl. hor.}}$ = 6/6 (R.V. in 1918 had 6/5 $\bar{c}$ −1 D. sph.) Sight in right eye failed gradually. Cyst in right upper lid. Incised. Noticed the improvement in his vision the day following the incision of the cyst.

18 January, 1921.—R.V. 6/9 $\bar{c}$ $\frac{-0{\cdot}5 \text{ D. sph.}}{+1 \text{ D. cyl. down and in } 60^{\circ}}$ = 6/5 slowly. L.V. $\frac{\bar{c} - 0{\cdot}5 \text{ D. sph.}}{-0{\cdot}75 \text{ D. cyl. hor.}}$ = 6/5 most. J 1 $\bar{c}$ + 2·5 D. sph. added.

These three cases appear to me to be of some interest, and, as far as I know (although probably the condition has been noticed before) I do not think it has been recorded, and the first case certainly found me unprepared for the *dénouement*.

All these cases had a Meibomian cyst in the upper lid, which showed some degree of chronicity, and the cysts were hard and protuberant. All three patients had become accustomed to the cyst and did not associate their failure of vision with its presence. All complained of a gradual failure of sight in the eye having the cyst, and all recovered normal vision after removal of the tumour. I should say that the ocular tension in all three cases was rather subnormal than normal, although I have no accurate tonometric measurements.

The amount of temporary astigmatism produced varied with the size of the tumour, the first case having by far the largest cyst. The second case seems to have increased the hypermetropia as well as the astigmatism. The retinoscopic shadows were broken up and whorled as in conical corneae in all three cases.

I have to thank Mr. McGillivray for his note regarding the first patient and Mr. Leslie Paton, who saw her after I did.

SOME EXAMPLES OF IDIOSYNCRASY

BY

T. HARRISON BUTLER

BIRMINGHAM

THE effects of an idiosyncrasy may occasionally cause serious symptoms and may affect the reputation of the practitioner who is responsible for administering the remedy which has had an unusual effect. It seems wise, therefore, that cases of this type should be

recorded. I have collected the following examples which are of an unusual type, but which might easily occur to any ophthalmic surgeon.

Linseed.

Nurse B. consulted me about her swollen eyes. She told me that whenever she makes a linseed poultice, or handles the seed in any form, she gets an acute conjunctivitis, which begins in from one to two hours after contact. This has happened four or five times, and the resulting inflammation has lasted some days and been cured with difficulty. Invariably the right eye has suffered most severely.

The night before I saw Nurse B. she made a linseed poultice with the usual result.

The conditions found were the following: Right Eye. There is great chemosis of the lower ocular and palpebral conjunctiva, and in the lower cul-de-sac there are flakes of fibrinous matter. The upper lid looks slimy when everted. The eye is but slightly injected. Left eye. The appearance is similar, but the inflammation and swelling are very much less.

A simple boric lotion was ordered, and later a 5 per cent. solution of protargol. The eye took over a week to return to its normal appearance. The matron of the Leamington Hospital tells me that she recollects a nurse who developed urticaria whenever she handled linseed.

Yellow Oxide of Mercury.

Mrs. H., aged 50, came to the Warneford Hospital, and was found to be suffering from chronic conjunctivitis and blepharitis. I ordered her a quarter per cent. solution of sulphate of zinc with yellow oxide of mercury ointment.

In a week she returned with severe eczema of the lids. She said that each time she used the ointment the skin of the lids became inflamed. I told her to give up the yellow oxide ointment and continue with the zinc lotion; the eyes rapidly got well. I have no recollection of any other case in which this stock remedy caused any irritation of skin.

Holocain.

I had occasion one afternoon to use a drop of 1 per cent. solution of holocain for two elderly ladies, with a view to taking the tension with the Schiötz tonometer. I used the same solution for each. In the one case no pain was complained of and there were no after-effects. The other lady said the drops caused intense pain. The same evening the family doctor asked me to see my patient at her house. She was in bed and obviously ill, she had been vomiting, and had had some diarrhoea. Both eyes were much inflamed, and there was a mucoid discharge. Several days elapsed before the lids became normal. I think that there is little doubt that the lady had

a peculiar idiosyncrasy, and that holocain was highly toxic to her. Needless to say, she was very angry with me. The solution was not a fresh one, and contained a little chloretone to prevent the growth of moulds.

Chloretone.

This substance is largely used for the purpose indicated. Recently several of my patients have complained of pain after the instillation of cocain and homatropin. I tried the cocain upon one of my boys, and he too complained bitterly. The cocain solution was furnished by Parke Davis, and I have had it by me for some time. I am inclined to ascribe the pain to the chloretone, or to some decomposition product of chloretone. I have now had my solutions made up without this drug, and I have had no complaints of pain. I have used the Parke Davis solution for years, and so I wonder whether any change takes place after some time which produces an irritating substance.

Cocain Eserin Sequence.

Because of the trouble mentioned with the holocain solution I threw it away, and then found that for some time I could not get any more. This led to another instance of idiosyncrasy.

Mr. W., aged 70, is under my care with chronic glaucoma. Although his tension is raised, there are at present no symptoms; and, as he has a fistula in his back following nephrotomy, I am postponing operation as long as possible. He sees me from time to time, and I take his tension with the tonometer. He was one of those who complained of my holocain, and when I was without this drug I used a drop of cocain. This dilated the pupil, so before I dismissed him I instilled a drop of eserin. He told me that after he left my house he felt very giddy and faint and had difficulty in getting home. I did not ascribe this to the drops used because I knew that he was a nervous highly-strung man. Next time he came I used the same drops and with a worse result. No ill-effects followed the use of cocain or eserin alone. It is quite common for young persons with strongly-developed accommodative power to feel very giddy when eserin is used after homatropin, and for this reason I never use eserin; but in the middle-aged and aged, with feeble or no accommodation, one does not expect it. When I was unable to get holocain I used the cocain eserin sequence scores of times for tonometry, and I have had no other example of this nature. I can only imagine that Mr. W. has an idiosyncrasy for this sequence. The cases I have cited show that we must always be on the look out for these peculiarities, and that when our patients tell us that they react abnormally to certain drugs, we must act upon their infomation, however unusual it may appear.

ANOPHTHALMIA AND MALDEVELOPMENT OF THE EYES: FOUR CASES IN THE SAME FAMILY

BY

LEWIS MCMILLAN, M.D.,

HON. SURGEON GLASGOW EYE INFIRMARY, OCULIST TO THE GLASGOW CORPORATION

WHILE holidaying in the Highlands in August of 1919, I was asked by the parochial authorities to report on the condition of the eyes of the family of A. C., a labouring man dwelling in the Benderloch.

The parents were young, healthy-looking individuals, and lived in a cottage on the loch-side. The external appearance of their eyes was quite normal, and they had no complaint of visual defect. Apart from the condition of their eyes the four children appeared quite healthy and well developed. The local doctor, Dr. McNichol, who visited the house with me, informed me that there had been no inflammation of, or discharge from, the children's eyes at or after birth. The appearance of their eyes was entirely one of under-development. So far as we could ascertain there had been no similar condition of the eyes in the parentage on either side.

C. C., female, 5 years of age. The right eye was undeveloped, the cornea absent, and the eye blind. The left eye was more developed, the cornea was clear, and there was a downward coloboma iridis congenitalis. The child was able to distinguish and name correctly a penny-piece held out to her. The mother stated that the child could see to lift an ordinary pin from the floor. With the means at my disposal I was unable to define clearly the details of the fundus oculi.

J. C., male, 3 years of age, was absolutely blind. The right socket was empty, anophthalmos, and the cavity was contracted. The left eyeball was undeveloped, the cornea being absent.

C. C., male, 2 years of age. This boy was also practically blind. A small dark spot in the centre of the front of the right eyeball represented the cornea, and through this light and darkness could be distinguished. The left socket was empty, another case of anophthalmos.

M. C., 1 year old. The right eye resembled those seen in the other children, undeveloped, opaque, and blind. The left eye was the most normal-looking eye seen in any of the children. It was clear, bright, and healthy looking. The iris was fully developed, the pupil circular, and responding well to light. The details of the interior of the eye could be clearly seen through the ophthalmoscope. The child could see well enough to take hold of objects held out to her.

I recommended that an attempt should be made to educate the eldest and the youngest children in the ordinary way, and that the second and third should be educated in a blind asylum.

The parents are young and evidently prolific. Whatever the prenatal cause may be, the outlook for any future children is to me simply appalling.

INJURIES FROM HIGH EXPLOSIVE*

BY

J. LOCKHART GIBSON, M.D.Edin., M.R.C.S.Eng.

BRISBANE

(1) Private C., aged 26.—L.E. Traumatic cataract caused by high explosive, July, 4, 1918. Dense occluding remains of lens and capsule in pupil. Was told in England "that nothing could be done to improve sight."

Jan. 20.—A small comparatively thin central part of occluding membrane allowed a small opening to be needled in it, resulting in corrected vision 6/12 and 2 of 6/9 and J. i.

The other eye (right) had been broken up by the force of the explosion, and was quite blind and irritable when he came to Brisbane. Its enucleation gave much relief. The patient also lost one leg above the knee.

He had been so impressed by the belief that nothing could be done that he naturally hesitated to let me try.

The force of the explosion was exerted in this case on the lens, and the fundus escaped.

He owes the result largely to his youth.

(2) Private C., aged 22.—Note disappearing siderotic spots on cornea and sclera after removal of small steel particles, after thirty months' of residence. One eye (left) shows a rupture of the choroid to upper inner side of the disc, as well as some fine opaque striae in the inner half of the lens. Its corrected vision is 6/9 and one letter of 6/6.

The other eye (right) shows a rupture of the choroid close to the macula, and it only sees fingers at one yard.

The ruptures of choroid due to "contre coup."

The lenses escaped injury.

Note many steel particles under the skin of the face.

(3) Gunner W.—Numerous powder marks in neighbourhood of eyes, and forehead, and in conjunctivae. Double traumatic cataract. Dense remains of broken up lens and capsule occluding both pupils. Taught Braille at St. Dunstan's, and sent back as a blinded soldier. Counting fingers at 2 feet with right eye, at 6 inches with, left eye. Right eye sees now with correction 6/9 and J. i. Left eye opacity still very dense in spite of two needlings,

* Card specimens shown at the 11th Australasian Medical Congress, Brisbane, August, 1920.

and it sees fingers at 2 yards only with correction. Further needlings will give good result, provided fundus is uninjured.

Irritation from powder grains in ocular and palpebral conjunctiva has gradually subsided.

Owes his sight largely to his youth.

CONJUNCTIVAL PEMPHIGUS

BY

D. J. WOOD

CAPE TOWN

CASES of conjunctival pemphigus are sufficiently rare to be worth recording, especially where treatment has had some effect in retarding the advance. L. H., a Jew of 19 years, came to me in July, 1916. He gave the history of having been treated for trachoma for many years. In spite of treatment he had grown steadily worse, and his left eye was practically blind.

His eyelashes were gone except a few stumps, there was rounding of the edges of the upper lids and the left cornea was opaque. The right cornea was full of vessels and very hazy and there was much conjunctival shrinking. The outstanding features were, however, the absence of redness of the eyes and lids and the dryness of the corneae. I did not at the first interview go farther than deciding that it was not a case of ordinary trachoma, and going on former experience I put him on saline irrigation and closure of the eyes. When I saw him after a week I got the clue to his case in the history which he gave of having had pemphigus, and, of course, one recognized at once what one had to deal with.

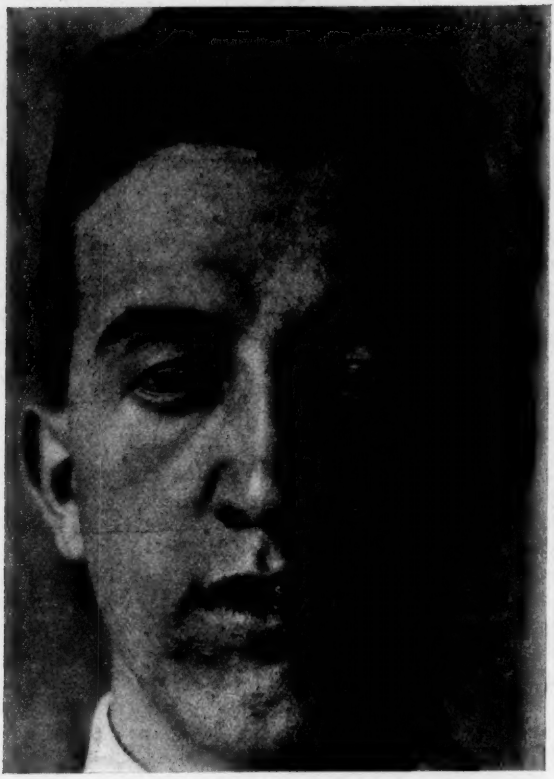
Within about two weeks he could see quite well with the right eye, and the left had grown much less dry looking.

A bacteriologist kindly interested himself in the case, and found in blebs on his body an aurococcus, and a vaccine of this produced a bullous eruption from which a diphtheroid organism was isolated. He had in fact at this time four distinct skin diseases, pityriasis circinata on his chest, tinea versicolor on his back, facial acne, and a few pemphigus bullae. Neither vaccines nor a course of arsenic seemed to do any good.

I attempted to graft new conjunctiva round the cornea, but I was met by a difficulty; the conjunctiva was densely adherent to the deeper tissues everywhere and only a small bit was inserted and lived. I may try this again, as the new tissue seems healthier than the old, and possibly the injection of fluid under the conjunctiva might loosen the surface, and permit of the insertion of grafts. There is no doubt that what did most good from first to last was the covering up of the eyes, and this has had to be resorted to on several occasions during relapses.

I have never myself seen a bleb on his conjunctiva, but on two occasions blebs were seen by the nurses, and I have constantly seen their traces in the shape of dry spots on the lids or eyeball, associated always with a complaint of pain or some evidence that the disease had grown worse for the time.

The left eye has grown slowly worse and is of little use to him, but with the right he still retains about 6/24 and reads without



much difficulty. It does not seem to have gone back at all in the three years I have had him under observation, but does not stand work well, the eyes getting red and showing dry patches on small provocation. The treatment has always been of the simplest: saline irrigation, weak zinc sulphate drops, and a little white vaseline at night, falling back always on complete occlusion of both eyes whenever the disease seemed to be advancing.

ANNOTATION

The International Congress of Ophthalmology

In a little over a year's time the Congress of Ophthalmology, which has been arranged under the auspices of various American Ophthalmological Societies, will take place in Washington. We would urge on all British ophthalmic surgeons the desirability of considering ahead, in their arrangements for next year, the possibility of attending this. We fully realize the difficulties that our American confrères will have in securing at the present time anything resembling an International representation at the Congress. The adverse rate of exchange will make it extremely expensive for all European surgeons, and almost prohibitive for some nationalities to go to the United States; but although that will affect British members, it will do so in a much less degree than others. It is only in America that it would be possible to arrange such a Congress at the present time, and we owe it as a duty to our co-workers there to recognize their energy by supporting it by an early subscription, and, wherever possible, by personal attendance. It is not needful to dilate on the hospitality which the inhabitants of the United States show to all their guests. What is of greater importance to us in this country to realize is the vast amount of good work that is being done in ophthalmology in America. We are often accused of insularity in this country, and with some justification. The spirit of provincialism is very rife, and not least so in London itself. It is good for us to get away from it for a time, and in a humble mood of enquiry, wander afield and see what other people are active about in the world. It is in this spirit that we would urge our readers to contemplate seriously the possibility of arranging a visit to Washington in April of next year. The preliminary arrangements for the Congress were published in this journal of February, 1921. The subscription of $10.00 should be sent to Dr. Walter R. Parker, 1025 David Whitney Building, Detroit, Michigan, U.S.A. At present rates of exchange, $10.00 is equal to £2 12s. 6d. (approximately).

ABSTRACTS

I.—CATARACT

(1) **Darier, A. (Paris).—The surgical treatment of cataract. (Le traitement chirurgical de la cataracte.)** *La Clin. Ophtal.*, August, 1919.

(1) In a space of less than twenty pages, **Darier** has written a

miniature treatise on cataract extraction. Though, doubtless, it contains nothing much that is actually new, the article forms a very excellent synopsis of modern practice and it is written in the usual lucid style which makes all the work of this surgeon so pleasant to read. One notes that Darier is a strong advocate of preliminary iridectomy in the majority of cases. As one would naturally expect, his armamentarium for the treatment of wound infection is particularly complete in the direction of serumtherapy. Nevertheless, full weight is given to the value of all the usual kinds of local treatment by which infection is combated.

ERNEST THOMSON.

(2) **Sternberg, Joseph E. (Boston)—Complications in the intracapsular extraction of cataract.** *Amer. Jl. of Ophthal.*, p. 282. April, 1920.

(2) **Sternberg**, from his experience with twenty-three cases of intracapsular extraction, is enthusiastic over the Smith cataract operation.

In his first nine cases he made the incision as suggested by Smith, viz., ending from 1 to 2 mm. inside the cornea. Healing was slow, the wound taking from ten days to two weeks to seal tightly. In his next five cases he made a slight conjunctival flap with good results, healing taking place at from the fourth to sixth day. These eyes were inspected daily after the third day to study the healing process. Iridectomy was performed at the time of extraction.

For delivery of the lens a fairly large incision is essential (almost half the cornea). No flushing of the eye after extraction was performed.

Application of yellow oxide of mercury with atropin to the lids of the operated eye, and of the yellow oxide without atropin to the sound eye, the atropin being used to counteract iritis.

Post-operative pain is controlled by the use of sodium bromide given an hour or so after the operation.

In the later conjunctival flap operations the eye was not examined until the seventh day, although the dressing was changed on the third day in a darkened room. The unoperated eye is left uncovered at this time, and smoke glasses, No. 4 tint, provided.

Iritis occurred in almost all Sternberg's cases, but responded readily to atropin and cleared in a few days.

Emphasis is laid upon the advantage which belongs to the conjunctival flap operation, healing being more rapid. The incision should always be large enough to allow of the delivery of a possibly large lens. Proper management of the Fisher hooks by a capable assistant is essential. Inspection of the operated eye should not take place for a week.

J. HAMILTON MCILROY.

(3) **Post, M. Hayward, Jr., M.D. (St. Louis, Mo.)—Proper time for operation on congenital cataract.** *Amer. Jl. of Ophthal.*, April, 1920, p. 277.

(3) In reporting a case **Post** discusses the question of the proper time for operating on congenital cataract. Should such cases be operated upon early—say before the 10th year?

The patient, aged 23 years, suffered from bilateral congenital cataract and had been seen by Dr. Post, sen., 10 years before. Operation had been postponed for various reasons and the patient was able to proceed with her education to some extent. When seen by the writer the patient urged operation, and the eye with the poorer vision was operated upon by needling. Recovery was uneventful, but the vision ultimately attained was not satisfactory, a central scotoma being present about a year afterwards. The patient was anxious to have the other eye treated, but the writer was reluctant to interfere in view of the unsatisfactory result of the first operation. This difficulty led him to review the literature of the subject and compare the results of late operations on such cases with those of earlier operations. He found little literature, but as a rule writers held that the dangers from amblyopia ex anopsia are greater in proportion to the amount of lens involved, and the consequent impairment of the function of the retina. In the case of diffuse cataract all agree that early operation is imperative, but opinions differ for the lesser degrees.

Complete absorption of the lens substance is much more likely and rapid in young subjects. Fuchs demands operation during the first year of life, and if possible at the age of a few weeks. Grod, however, holds that early operation causes arrest of growth of the eye, and less useful vision is obtained than in the later cases. Swanzy advocates treatment early in life by discission and absorption, rather than by extraction later, discission being applicable up to the age of twenty-three. The mass of evidence was in favour of early operation, too lengthy postponement leading to degeneration of the retina with loss of function. (It may, however, be possible to restore the function to some extent by means of exercise and so to overcome the disadvantages of late operation).

Post deprecates postponement from the point of view of the mental effect upon a sensitive adolescent. Mental anxiety as to the fate of the eyesight, coupled with some dread of the operation, through a number of years, is detrimental to the prognosis. The child of ten is not introspective and the operation proceeds without mental complications. In the case reported, the second eye was operated upon two years after the first operation, and the patient became hysterical and unmanageable. Recovery was not satisfactory, and within a few weeks glaucoma developed, vision being lost.

General development of the child is favoured by treatment of the cataract at an early age. The writer quotes a case in which the first operation was done upon one eye at the age of ten, at which time the child was inferior mentally and physically. Improvement in mental and physical development rapidly took place after removal of the cataract, and the child would ultimately merge with the normal children in school.

Post therefore advocates operation about the eighth year, *i.e.*, after the eyes have had the greater part of their growth, and before retinal deterioration has taken place. Operation at this age is of the simplest type, and anxiety neurosis on the part of the patient is at a minimum. The child is thereby enabled to grow up under as nearly normal conditions as possible.

J. HAMILTON MCILROY.

(4) **Lowell, W. Holbrook, M.D. (Boston, Mas.).—Preliminary report on sub-conjunctival cataract operations.**—*Amer Jl. of Ophthal.*, April, 1920, p. 275.

(4) In 1918, **Lowell** became acquainted with the operative method described by Husain of India, and took it up. In the present paper he describes the technique of the operation, with its advantages, and gives the results of 17 cases operated upon by himself and his colleagues.

The technique of Husain's operations is as follows:—A small opening was made in the conjunctiva about 1 cm. above the sclero-corneal margin (patient looking down), and this was enlarged laterally to 1·5 cm. in length, keeping the line of the incision equidistant from the sclero-corneal margin. Through this opening the subconjunctival tissue was cut to the limbus. Then with the scissors closed, and by lateral movements, pockets were made on each side of the central sub-conjunctival tunnel, a stage of the operation which may be attended with severe haemorrhage. The lower edge of the conjunctival incision was lifted with forceps, and with the angular keratome the anterior chamber was punctured at the sclero-corneal junction. Still holding the conjunctival flap with the forceps in left hand, one blunt blade of the scissors was passed through the keratome incision, above and along the plane of the iris, and the sclero-corneal junction was cut first on one side and then on the other to give an opening sufficiently large for delivery of the lens. Iridectomy, capsulotomy and delivery of the lens should follow without difficulty. If blood collects in the anterior chamber at any time it must be completely washed out at once, as it coagulates very quickly. Irrigation after delivery to remove cortical matter is advisable. The pillars of the iris having been replaced, the conjunctival flap was carefully smoothed back, approximating the cut edges as well as possible. One stitch placed centrally in the

flap, was removed on the third or fourth day. A drop of atropin and perchloride of mercury ointment were applied. A double bandage was kept on for six or eight hours, after which the unoperated eye was left uncovered.

(Lowell is of opinion that many cases of dementia may be obviated by giving the patient one eye.)

It is claimed that there is no danger of the wound opening a few hours after this operation. Husain found the average time of patients in hospital was 4.84 days; Lowell found about six days represented his own average.

The chief advantage claimed for the operation is the quick healing of the conjunctival wound. The eye being thoroughly cleansed before the operation, and collargol being dropped in after the operation, and the conjunctival opening being at a considerable distance from the sclero-corneal wound, the likelihood of exogenous infection in this operation is reduced to a minimum, and the internal wounds heal remarkably quickly. Husain claims that suppurations are reduced to 0.4 per cent. of ordinary cases of cataract. His operation is based on the work of Czermak and Hari Shanker in the same field, but his modifications make his operation a distinctive one.

J. HAMILTON MCILROY.

(5) **Morax, V., M.D. (Paris)—Cataract operation on glaucomatous patients.** *Amer. Jl. Ophthal.*, August, 1920, p. 561. Series iii, Vol. III, No. 8.

(5) Although the co-existence of senile cataract and glaucoma is infrequent, the problems attendant upon the double condition are very grave, and **Morax** contributes to the subject with the history of two typical cases in which glaucoma was the earlier condition, and cataract the complication. He suggests that reports from other surgeons in regard to individual experience would be helpful when the following questions come to be answered, viz.:

(1) May we and must we operate?

(2) At what time of the evolution of the cataract is it most suitable to operate?

(3) In what manner shall we intervene for the extraction of the lens, and for the maintenance of the fistulous scar which prevents the loss of the retinal function?

(4) What will be the functional result, and how long will the function last?

Morax has adopted the method of treating all such cases as primarily cases of cataract when it is a matter of visual urgency. He urges that extraction should not be shirked in these glaucomatous eyes if there is reasonable prospect of improvement in vision from the operation.

A brief summary of his two cases, with his comments, may be given.

CASE 1.—Woman aet. 61. History of cataract with glaucoma in the mother and glaucoma in a sister.

1910. (When first seen) R.E. V. = $\frac{8}{10}$. L.E. V. $\bar{c}$ — 5 D. sph. = $\frac{1}{2}$. Tension increased. Use of miotics for 2 years controlled tension. Carelessness in use, however, led to increase of tension. Iridectomy performed by another surgeon.

1913. L.E. cataractous. Tension increased in both eyes. Use of miotics was not carried out by patient. R.E. sclerecto-iridectomy. Tension remained satisfactory, but myopia increased.

1916. R.E. V. $\bar{c}$ − 5 D. sph. = $\frac{1}{3}$. L.E. V. $\bar{c}$ − 9 D. sph. = $\frac{1}{5}$. (Nasal contraction of visual field).

1918. R.E. V. = $\frac{1}{10}$ (due to lenticular opacity); filtering scar active; tension low. L.E. V. very defective. Lens extraction. (Scleral section placed peripherally resulted in a small filtering scar). Tension remained fairly good, and vision (corrected for aphakia) became = $\frac{1}{10}$.

CASE 2.—Man aet. 60. R.E. Well-marked glaucoma with almost complete loss of vision (cupping and atrophy of disc). L.E. V. = $\frac{2}{3}$. Peripheral opacity of lens; slight cupping of disc. Pilocarpin prescribed, but patient was negligent in carrying out treatment.

Two years later.—Tension increased; lens opacities more marked, visual acuity diminished in miosis. Patient refused sclerecto-iridectomy.

Four years later.—L.E. V. = $\frac{1}{2}$. Tension much increased; nasal contraction of visual field. Pilocarpin failed to reduce tension. Sclerecto-iridectomy (with wide iridectomy) was performed. Recovery normal, but no filtering scar ensued.

Four months later.—Tension still high. Vision = $\frac{1}{8}$.

Three months later.—Anterior sclerotomy. Tension did not fall.

One month later.—A second sclerecto-iridectomy resulted in a good filtering scar. Tension remained low for a year.

One year later.—Extraction of lens (sclero-corneal incision on side between XI—IV o'clock). Filtering scar was no longer protruding, but tension improved for a time.

Two months later.—Tension rose in spite of pilocarpin, and a third sclerecto-iridectomy was performed. No filtering scar was left, and the tension rose again. Sight was lost in less than a year.

Comments given by author.

CASE 1.—Operative interference had nothing to do with the lens myopia, as this condition had begun before operation, and was slow

in progress. The results in the two eyes may be tabulated thus:

In one eye (L) ***simple iridectomy*** did not relieve tension in spite of miotics. Field of vision contracted nasally. Extraction of lens (immature cataract) was performed without difficulty or adverse incident, and had a beneficial effect upon the tension.

In the other eye (R) ***sclerecto-iridectomy*** with peripheral iridectomy was performed. Filtering scar produced relief of tension for the last seven years.

CASE 2. One must not despair of obtaining reduction of tension even although the first sclerecto-iridectomy has failed to produce the desired result. In the case cited, a filtering scar was obtained only after the second operation.

Extraction of the cataractous lens proceeded normally, the incision being well outside the filtering scar (of previous operation). The filtering scar, however, became obliterated during repair, and tension rose. No matter how careful our technique may be, we can never be sure of obtaining a good filtering scar, and the third sclerecto-iridectomy in this case was a failure.

J. HAMILTON MCILROY.

II.—THE JUDGMENT OF DISTANCE

(2) **Howard, Capt. Harvey J., M.D. (Peking,)—A test for the judgment of distance.** *Amer. Jl. of Ophthal.*, Sept., 1919.

IN this paper **Howard** gives the results of investigations made by him at the Medical Research Laboratory, Hazelhurst Field, Minneola, N.Y.*

The investigation was undertaken with the object of finding a satisfactory test for the examination and classification of applicants for the aviation service. The only test referred to in the aviation manuals was that for stereoscopic vision, a hand stereoscope with special aviation charts being used.

Errors in judgment of distance, whether in rising from the ground during flight or in landing, may be taken as accountable for the great majority of deaths among aviators.

Howard goes into the subject of the judgment of distance somewhat minutely.

* This paper was read at the American Ophthalmological Society, 16th June, 1919. In the discussion which followed other workers on the same subject took part, among these being Dr. Blaauw, of Buffalo, Dr. Spearman, of London, and Dr F. H. Verhoeff, of Boston. Captain Howard was congratulated on a very valuable piece of work.

The factors involved in judgment of distance are:

(*a*) ***Those which are common to both monocular and binocular vision,*** viz.:

1. Size of the retinal image.
2. Accommodation.
3. Motion parallax.
4. Terrestrial association { *a.* Linear perspective. *b.* Overlapping of contours. *c.* Light reflections and shadows.
5. Aerial perspective, i.e., changes in colour, brightness, etc., which distant objects undergo on account of variations in the clarity of the intervening atmosphere.

(*b*) ***Factors which operate only for binocular single vision:***

1. Binocular parallax.
2. Convergence.

For classification purposes all factors, except those which represent differences in individual ability among the observers, are eliminated, and the following factors therefore are excluded in the test: (1) ***Motion parallax*** (being produced by movements of the observer, or of objects in his field of vision, are not related to innate individual ability). (2) ***Terrestrial association***, and ***aerial*** perspective (being factors which are not directly related to the individual and are common to all observers). (3) ***Accommodation*** and ***convergence*** (being factors which operate for short distances only, and therefore negligible in a test which is carried out at 6 metres or over).

The factors to be made use of in this test are therefore:

1. The size of the retinal image.
2. The binocular parallax.

Apparatus.—The apparatus employed was a slight modification of that devised by Brooksbank James ("Measurement of Stereoscopic Visual Acuity," The *Lancet*, June, 1908, p. 1,783). It consists of a three-sided box, the open side being placed uppermost. In the front of the box there is an opening which can be closed by means of a shutter. A board passing from the front to the back attached to the floor carries a scale, the lines of which are 0·5 cm. apart. The markings of this scale are crossed at right angles by two parallel lines placed 6 mm. apart. Holes are bored at the points of crossing, and into the holes can be fitted rods with pointed ends, the length of each rod being 26 mm. and the diameter being 1 cm. The interior of the apparatus is black, with the exception of the back wall which is of dead white cardboard. A strong light is fitted in the interior in such a way that it illumines the white wall, and is out of the direct line of vision of the observer. All parts of the apparatus are made to exact measurement. The apparatus stands on a table which is placed at a distance of 6 metres from

the observer, who sits at another table, his head being kept steady by means of a forehead rest, which is clamped to the table. The room is completely darkened except for the light within the box.

The operator stands beside the box, and when everything is in readiness he raises the shutter suddenly and the observer has practically an instantaneous view of the rods, which are thrown into strong relief against the white background. He is asked to state whether the right or the left rod is nearer to him, and is told that at no time are the rods equidistant from his eyes.

Every effort is made to deceive him in regard to the position of the rods, in order to test his judgment severely. A pack of 20 blank playing cards, 10 of which are labelled right and 10 left, are shuffled before the test, and used to determine the position given to the rods.

Twenty judgments are taken at each of the five stations. Usually 30 mm. is taken as the first depth difference, i.e., the nearer rod is 6,000 mm. and the further rod 6,030 mm. from the eyes of the observer.

(*a*) If the 20 judgments are correct, the depth distance is reduced to 20 mm., 15 mm., 10 mm., and 5 mm. respectively until the observer begins to show faulty judgment.

(b) If the 20 judgments are not all correct, he is tried at 40 mm., 50 mm., 60 mm., and 90 mm., until his judgments are all correct.

The difference in distance between the near and the far object is termed the ***depth difference***, and the angle subtended by the depth distance is the ***binocular parallactic angle.***

The binocular parallactic angle is taken as 1·803″ when the interpupillary distance is 63 mm. (i.e. the smallest), the depth distance 5 mm., and the nearer object being at a distance of 6 metres from the observer.

On this basis the b. p. angles were worked out for interpupillary distances ranging from 57 mm. to 72·5 mm., and for depth distances ranging at regular intervals from 5 mm. to 360 mm.

The smaller the interpupillary distance, the smaller the b. p. angle. The ***smallest*** i. p. distance (viz. 57 mm.) represents a b. p. angle of 1·80.″ The ***longest*** i. p. d. (viz. 72·5 mm.) represents a b. p. angle of 2·07.″ There is thus a difference of 0·27″ in the b. p. angle, or, in other words, the man with the longest i. p. d. enjoys a physical advantage of 15 per cent. over the man with the shortest i. p. d. apart from any question of individual ability.

106 observers were examined, 75 of whom were aviators. Classification was made according to the shortest depth distance at which the observer is still at or within his threshold, i.e. at which at least 75 per cent. of his judgments are correct (a small number of wrong judgments being allowed as guesses).

Classification fell into 12 groups according to the depth difference thresholds of the observers.

Class A contained 26 observers, the depth distance being 5 mm., 14 of these were practically perfect; the remaining 12 had b. p. angle averaging 1.89." The i. p. d. averaged 66.14 mm.

Class B contained 30 observers with threshold of 10 mm. and b. p. angle averaging 3.67."

Class C contained 15 observers with threshold of 15 mm. and b. p. angle averaging 5.5."

Class D contained 23 observers with threshold of 20 mm. and b. p. angle averaging 7.3."

Of the remaining 8 classes the thresholds ranged from 30 mm. to 360 mm., and the b. p. angle from 10·6" to 136·2".

Broadly speaking, those in Class A had perfect or almost perfect visual acuity, with normal refraction, muscle balance, convergence, etc.; the other classes showed a gradual downward tendency in regard to these points, and the i. p. d. averaged about 2 mm. less than those of Class A. For an observer to exhibit poor judgment as evinced by a depth distance of over 20 mm. there appears to be a physical explanation in respect of asymmetry, refractive error, fatigue, etc. The great majority of flying men fell into the first four groups.

Howard recommends as normal those who show a b. p. angle of not more than 8·0". Thus tested, he emphasizes the value of giving an instantaneous view of the rods by means of the shutter.

The secret of successful aviation lies in making *instant* decisions, and he suggests that the test might be amplified so as to make record of the reaction time for depth perception. The aviator who possesses very short reaction time as well as a small b. p. angle should be most successful in his profession.

Monocular judgment of distance.—In order to discover how far the loss of an eye should disqualify for aviation, ten men were examined for monocular judgment. This faculty depends on two factors, viz.: (1) terrestrial association and (2) the size of the retinal image. The result showed that the monocular depth difference threshold was only a *twentieth* of the binocular; in other words, the binocular parallactic ability is twenty times more valuable in judging distance than the discrimination furnished by the perception of the retinal image, which is all that the monocular vision has to go upon. The reaction time required for monocular judgment is very slow, binocular judgment is practically instantaneous. In monocular judgment we must either recognise the object fixated, or be able to associate it with some well known object. Monocular vision is liable to "reversal deception," e.g., a valley may appear in perspective as a hill, or vice versa. This defect would be a serious matter in aviation.

Binocular single vision, on the other hand, may be deceived only when the depth difference is less than that subtending the observer's least b. p. angle. Difficulty in binocular judgment might arise in the case of a perfectly flat surface with no objects for comparison within the field of vision, e.g., in judging the distance of an aeroplane from a perfectly calm sea, in which case it is a question of absolute rather than relative distance. Judgment of absolute distance is the chief problem of an aviator, and correct judgment depends on the summation of a series of judgments for relative distance. It is the untrained aviator who commits error in judging distance on the water.

Similarly for night landings; there is here a lack of the necessary visual and depth difference contrasts. The American Navy has devised an apparatus to overcome this in the shape of an indicator which consists of four spot lights, the rays of which are projected downwards in such a way that at an altitude of 50 feet the beams meet and form a single spot on the ground, whilst at a lower level the rays diverge.

J. HAMILTON MCILROY.

III.—SYPHILITIC INFILTRATION OF THE CONJUNCTIVA

Weekers, L. (Liège) — Syphilitic gummatous infiltration of the conjunctiva: a contribution to the pathological anatomy of nodules of the iris. (Infiltration gommeuse syphilitique de la conjonctive: contribution à l'anatomie pathologique des papules de l'iris.) *Arch. d'Ophtal.*, July-August, 1919.

Syphilitic lesions of the conjunctiva are uncommon; of all the mucous membranes the conjunctiva is that most rarely attacked by syphilis. Fournier stated that he had seen only three cases of undoubted syphilitic lesions of the bulbar conjunctiva; on the other hand, Wilbrand and Staelin noted conjunctival lesions (papules) in 10·5 per cent. of 200 cases of recent syphilis. Weekers has on many occasions diagnosed as probably syphilitic, conjunctival lesions (small red papules) occurring in the subjects of syphilis and disappearing quickly under general treatment.

The case he now records (with four illustrations) occurred in a woman, aged 59, in whom the Wassermann reaction was strongly positive. Her right eye had been inflamed for one month, and painful and dim for ten days. The upper lid was red and oedematous; the bulbar conjunctiva was much thickened, especially at the limbus, which it overlapped; under the upper lid a rounded swelling the size of a pea could be felt; in consequence of the swelling it was

impossible to evert the lid. There was extensive superficial haze of the cornea with punctate deposits on its posterior surface. No view of the iris was obtainable. The patient refused treatment in the hospital and disappeared for ten days. She then returned to hospital with right-sided pneumonia and died in three days.

The right eye was removed for examination. The swelling in the upper conjunctival cul-de-sac had the anatomical characteristics of a gumma. No tubercle bacilli were found. The ocular conjunctiva was the seat of changes identical with those of the gumma beneath the upper lid, but the cell infiltration was more diffuse and the vascularity less intense. The corneal stroma showed very moderate infiltration, but on the posterior surface there was an extensive and thick cellular deposit. There were other collections of cells free in the exudation filling the aqueous chamber.

The anatomical examination revealed some lesions which could not be observed clinically. In certain localized areas in the ciliary body and in the root of the iris there was cell infiltration identical with that in the ocular conjunctiva, and resulting in much disorganization of these structures. In the rest of their extent the ciliary body and iris showed signs of a moderately severe diffuse inflammation. The other ocular tissues were free from pathological changes. As a result of the anatomical examination, the author calls his case one of "gummatous infiltration of the conjunctiva, the iris and the ciliary body." Nodules of the iris co-existed with a gummatous infiltration of the iris and ciliary body, and with sharply defined gummata, notably the solitary gumma of the conjunctiva. The case was one of untreated syphilis in an old patient; in such instances, as in malignant syphilis, it is not unusual for the delimitation of the various stages of syphilis to be wanting and to find gummata co-existing with lesions of the secondary stage.

J. B. LAWFORD.

CORRESPONDENCE

THE TREATMENT OF MIGRAINE

To the Editor of the BRITISH JOURNAL OF OPHTHALMOLOGY.

SIR,—As ophthalmic surgeons are as liable as other mortals to attacks of migraine, I should like some of my fellow sufferers to try the effect of hot fomentations to the back of the head when the attack is beginning, or if the headache stage has already begun, cold or iced applications to the same region.

It is presumed that the ocular phenomena observed in the early stage of an attack are directly dependent on a wave of contraction of the cortical occipital vessels leading first to an impairment and then to a temporary loss of function of the cortex and therefore to temporary partial blindness.

It is further presumed that the wave of contraction of the vessels is followed by their dilatation allowing excessive blood to the region causing the intense headache and vomiting so usually associated with increased intra-cranial pressure.

The hot fomentations are applied in the hope of inducing the vessels to dilate before the muscle in their walls becomes too starved and fatigued to maintain their normal lumen. If successful in doing this not only will the first stage be cut short, but the second will be prevented.

The cold applications are hoped to cause contraction of the dilated underlying cerebral vessels, either directly or reflexly, or both.

In support of this theory it will be observed that as the vessels, with advancing age, become less elastic, and are therefore by their increasing rigidity less liable to exaggerated variations in their lumen, the attacks become, not only less frequent but also less severe.

A young doctor who suffers severely writes: "I have found the hot fomentations over the cerebellar region of great value, for which advice many thanks."

I should like, Sir, to hear from your readers their personal experience after trial if all other treatment has failed to stop the attack.

Yours faithfully,

WILLIAM LANG.

MANUAL OF OPHTHALMIC PRACTICE

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

SIR,—In justice to the Indian artists who worked for me, and to Messrs. Thacker, Spink & Co., who produced the Indian edition of my Manuals of Ophthalmic Practice and Ophthalmic Operations, noticed in your February number, I must ask you to allow me to point out to your readers that the opinion of the plates expressed therein is unfair to them and not met with in other reviews, except that in the *British Medical Journal*, apparently written by the same hand. In the January number of the *American Journal of Ophthalmology*, Dr. Edward Jackson, the editor, honours the "Manual of Ophthalmic Practice" by reviewing it himself at some length, and begins by saying "It is somewhat startling to western ophthalmologists to

have the latest text-book on ophthalmology, and one of the best printed and best illustrated, come to us from India." And later—"The coloured plates, however, are chiefly original. A few representing fundus conditions are taken from older works, but the larger part, 50 out of the 60 figures, those representing anterior and external ocular defects and diseases, are new; and reflect great credit on the skill of the artists that produced the originals, and the care and fidelity with which they are produced. They compare favourably with those of the kind to be found in any text-book or atlas of external eye diseases of European origin."

Messrs. E. & S. Livingtone of Edinburgh are bringing out the English edition this month.

Yours faithfully,

F. P. MAYNARD,
Lt.-Colonel, I.M.S. (Retd.).

CREWE,
Feb., 1921.

BOOK NOTICES

A Pocket Book of Ophthalmology. By ARTHUR JAMES BALLANTYNE, M.D., Lecturer on Ophthalmology, University of Glasgow, etc. Pp. 119 (interleaved). Edinburgh: E. & S. Livingstone, 17, Teviot Place. 5s. 6d.

The author's intention is to give the student a note book "to carry . . . with him to lecture-room and clinic, utilizing the blank pages for the insertion of diagrams and supplementary notes."

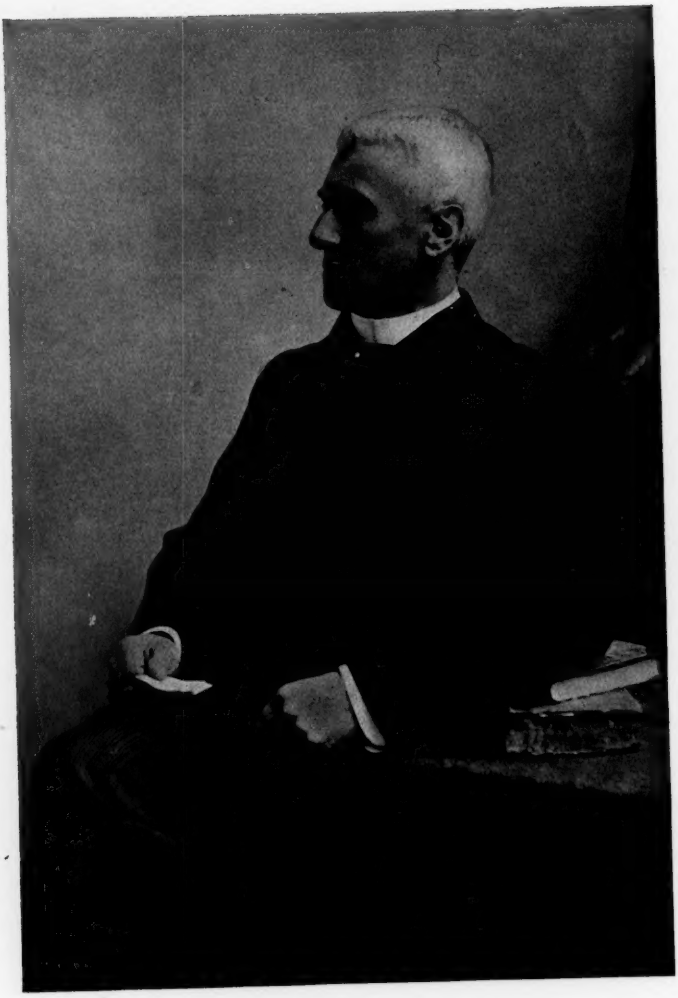
The book begins with a short anatomical account of the eye; passes on to its development and physiology, and then, after short sections on the methods of examination, and on refraction, gives a brief account of the various diseases of the eye. The descriptions of the diseases, their symptoms and treatment, are generally as good as could possibly be compressed into the limited space.

There is one unfortunate statement on page 97, which would be a very dangerous guide to the student; that is that the incision for the removal of cataract should separate "the cornea from the sclera for about three-fifths of its circumference." Such a large incision would be followed by many disasters.

There are a few—a very few—minor lapses; thus, for example, on page 79, under the head of Reduced Intraocular Pressure, "certain forms of uveitis," are given as a cause; but neither in the index nor in the text under the head of diseases of the uvea, is there any mention of "uveitis," and from the context, the student would consider it as something quite different from irido-cyclitis.

On the whole there is nothing but praise for the way in which the author has carried out his aims.

H. GRIMSDALE.



CHARLES HIGGENS, F.R.C.S.

From *Guy's Hospital Gazette*.

The Iris (L'Iris). By A. MAGITOT. Paris: Librairie Octave Doin. 1921. 16 francs, pp. 272; 27 illustrations, coloured and uncoloured.

The detailed title of this book is "A Physiological Study of the Pupil and its Motor Centres." It is announced as the first volume of a new series of ophthalmological treatises published by Doin, under the scientific control of Dr. Morax, and designed, gradually, to replace in the form of monographs, *l'Encyclopédie d'Ophtalmologie française.* It constitutes an excellent introduction to such a series and sets a high standard for subsequent volumes. The author is to be congratulated on his work; it is a well-written and comprehensive exposition of the subject, and is a fascinating book to study. Beginning with the anatomy of the iris, from man down the scale to the invertebrates (in which with few exceptions the iris is vestigial), Magitot proceeds with a full and reasoned account of the innervation of the iris and of the varied theories concerning its motility. He then deals at length with the pupillary reactions under two headings: (1) the reactions of the pupil in association with visual function, including the light-reflex *(réflexe photomoteur)* and the accommodation-convergence reaction; (2) reflex reactions independent of visual function, including the sensitive reflex (e.g., dilatation induced by pain) and psychical reflexes (e.g., mydriasis associated with fear).

There is also a chapter on pupillometers and one concerning the action of various drugs on the pupil. This is a work which appeals alike to the physiologist, the neurologist and the ophthalmologist. To do justice to it in a review would require pages of this journal. Want of space is our only excuse for so brief a notice.

OBITUARY

With the death of Charles Higgens there passes away one of the last of the old school of ophthalmic surgeons. He was appointed assistant ophthalmic surgeon to Guy's Hospital in 1873, ophthalmic surgeon in 1882, and, on his retirement from the active staff under the age limit of 60, was appointed consulting ophthalmic surgeon in 1906. He died on December 28, 1920, at the age of 75, and he performed his last operation at the Hospital within a month of his death. He had, therefore, an ophthalmic career of nearly fifty years, in which period he had accumulated a vast experience, both of patients and of disease.

No attempt will be made in this short notice to elaborate a formal biography of him, for he published little, though he knew a great

deal; rather it seems preferable to give a short description of him, "in his habit as he lived," for his personality was unique, and only those who knew him intimately could appreciate his experience and wisdom.

Who, that ever saw him walk down the Colonnade of Guy's Hospital, could forget Mr. Higgens? A wiry, small, neatly-made man, walking stiffly with a very rigid back, never an overcoat in the coldest weather, always wearing a hard round felt hat and a tightly buttoned cutaway coat, he looked, with his hard, lined, mahogany little face, clenched fingers, bent arms, and rather bowed legs, like a jockey or a pugilist rather than an ophthalmic surgeon; and until you had seen him operate you would never think that those stiff-looking hands and fingers were capable of performing, with the utmost dexterity and ease, the most delicate of all surgical operations. But your general impression of him would be correct, for he was a hard rider to hounds all his life and a good shot; moreover, he was a good light-weight boxer, and continued to box when he was over the age of 60, on one occasion giving an exhibition bout with a professional at Guy's Hospital. He would take the high dive at the Bath Club till he was well on the way to 70, and had several attempts at breaking his neck, either driving or in the hunting field, within quite the last few years of his life.

The term "a thorough sportsman" has been so vulgarized and debased in its usage of recent years, that one hesitates to apply it to Higgens, but in its original significance it was an accurate description. He went through life as he rode in the hunting field, courageously and straight. He said what he thought, had a very high ideal of professional conduct, and cared nothing for criticism or public opinion. In his later years he wrote several articles with reference to what he considered was charlatanism or malpraxis in his branch of his profession, but they never saw the light as it was difficult to find a journal courageous enough to publish them; so they remained, perforce, a joy to those who had the opportunity of reading them in private.

He wrote or published little; a text-book, one or two articles in the medical press and a few communications to societies comprised his public utterances. To those who had the privilege of working with him, however, he was a mine of information. He had a vast experience of private and hospital practice, and his usual phrase when you asked him a question was, "Well, I don't know why, but you will find that if you do this or that, so and so will happen." Nobody knew better than he what to do or how to do it. In difficult or doubtful cases he could always advise you whether to operate or not, and his advice was invariably correct; and in cases of complications after operations he could always tell you what to do and what the prospects were. He could never be prevailed upon

to write down his experiences of the art of ophthalmic surgery, but the present writer has tried in conversation to dig out all his knowledge, and can honestly say that Mr. Higgens was never shown a case that he had not seen before, or upon which he could not give that priceless advice that is never found in text-books.

He was a brilliant operator. There was nothing he could not do with an eye; and he was equally skilful with either hand. He had learnt to do cataract extractions under general anaesthetics before the days of cocain and modern aseptic methods, and he always remarked on the much better results obtained since the introduction of cocain, and on the practical disappearance of sympathetic ophthalmia in recent years.

Cataract extractions were his forte, and he did them, nearly always without an iridectomy, with extraordinarily successful results, principally owing to the fact that he handled the eye very little and used very few instruments. He only used two as a rule, a Graefe knife and a capsule hook; he never used a speculum or fixation forceps. He passed a stitch through the conjunctiva below the cornea for an assistant to hold, and held up the upper lid with the hand that was not holding the knife. After lacerating the capsule he expressed the cataract with his two thumbs, one making pressure through the upper lid and the other making counter-pressure below. If there was any soft material left behind, he got that out by stroking the cornea with a strabismus hook. His general custom was to extract amber coloured cataracts without an iridectomy, as these have a large nucleus with very little soft material, reserving an iridectomy for white cataracts where the nucleus is small with much soft cortex.

If he had to do an iridectomy he used no speculum, but kept up the upper lid with the third finger of his hand, holding the iris forceps with the thumb and first two fingers. His results were extremely good, as was shown by a paper he published in the *Lancet* some years ago on 116 ***consecutive*** cases of successful extraction of cataract in private patients.

Brilliant operator as he was, he never did an unnecessary operation, and this probably stands more to his credit than all the operations that he ever did. Time and time again did he dissuade patients with early cataract from having an extraction done by the enthusiast, who sees in every lens opacity the justification for an extraction before the other fellow gets it, and he would express himself in no uncertain terms to the patients, without any fear of libel or other consequences.

He was wont to say in his later years that very little advance in ophthalmic surgery had occurred in his day. When the operation of trephining for glaucoma was introduced in recent years, he said that he remembered Bowman doing trephine operations when he

was young, and there lies on the table now, before the writer, a gift from Mr. Higgens, a trephine made for Bowman, with the most ingenious device for fixing it to the sclerotic while rotating the trephine.

With regard also to dacryo-cysto-rhinostomy and to West's operation for lacrymal sac cases he remarked that he used to help Bader nearly fifty years ago in making holes through the posterior wall of the lacrymal sac into the nose.

When the War broke out, he was appointed to the staff of the big hospital at Epsom, and after taking a course of operative surgery he started plastic surgery of the face on an extensive scale, with extraordinary skill and success. His fresh outlook and receptive mind were marvellous for a man of his age.

Charles Higgens was one of the most popular men who was ever a member of a hospital staff, and he stuck to old friends. Up to the last he was an active member of the United Hospitals Club, which consists of members of the St. Thomas's and Guy's staff, and he was the perpetual president of one very old Guy's Hospital Dining Club, which dates back to his student days. Patients adored him and he was devoted to his patients. What better epitaph could any surgeon desire?

E.

NOTES

Royal College of Surgeons of England

APROPOS of the annotation in the January number of this journal dealing with the need of a higher diploma in ophthalmology, it is of interest to note that at the last quarterly meeting of the Royal College of Surgeons, upon the motion of Sir George Makins, a committee was appointed to consider the question of establishing additional examinations in ophthalmology and in oto-rhino-laryngology for candidates who desire to take them after having passed the examination for the Fellowship.

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University of Oxford

THE Board of the Faculty of Medicine has given notice that in and after Michaelmas term, 1921, candidates for the final M.B. examination will be required to submit a certificate of attendance at a course of practical instruction in ophthalmology, including not less than twenty meetings during a period of three months, at an ophthalmic clinic recognized by the said Board.

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Ophthmological Society

THE next Annual Congress of the Society will be held on Thursday, Friday, and Saturday, the 5th, 6th, and 7th of May next, at the Royal Society of Medicine, 1, Wimpole Street, W. 1. The president, Mr. J. Herbert Fisher, will deliver his opening address at 10 o'clock on the morning of the 5th. At 2.15 that afternoon a discussion will be opened on "The Psychology of Vision in Health and Disease," by Professor C. Spearman, Ph.D., and Sir W. F. Mott, K.B.E. The Bowman Lecture will be given by Mr. E. Treacher Collins under the suggestive title of "Changes in the Visual Organs correlated with the Adoption of Aboreal Life and the Assumption of the Erect Posture." Members of the Society and their friends will dine together in the evening. The morning of May 6th will be devoted to a discussion on the "Treatment of Manifest Concomitant Strabismus," to be opened by Mr. C. Worth and Dr. A. J. Ballantyne. The afternoon will be given up to a Clinical Meeting at St. Thomas's Hospital, Westminster Bridge. Lieut.-Colonel H. Herbert will read a paper at 8.30 p.m. on Friday on "Results of the Iris-prolapse Operation for Glaucoma."

During the Congress the Optophone will be demonstrated in the Bowman Library.

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Council of British Ophthalmologists

THE Annual Report of the Council will be presented to Ophthalmologists at a meeting to be held at 1, Wimpole Street, W.1, on Saturday, May 7th, 1921, at 9.45 a.m., immediately preceding the business meeting of the Ophthalmological Society of the United Kingdom.

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Moorfield's Annual Dinner

THE Annual Dinner of Past and Present Students of the Royal London Ophthalmic Hospital was held at the Café Royal, Regent Street, on Thursday, February 10th. Mr. J. B. Lawford, Consulting Surgeon to the Hospital presided, and there was a company of sixty-seven. Among the guests were Sir George Makins, Surgeon Rear-Admiral Sir Robert Hill, Lieutenant-General Sir John Goodwin, and Professor Elliot-Smith. The guests of the staff were Mr. H. P. Sturgis, Chairman of the Committee of Management of the Hospital, Mr. Fraser and General Studholme-Brownrigg, members of the

Committee, Mr. Robin Barclay, a member of the Appeal Committee, and Mr. Bland, Secretary to the Hospital. Besides the acting members of the Surgical Staff there were also present Mr. William Lang, Mr. Percy Fleming, Sir Arnold Lawson, and Mr. Worth. The speakers were Mr. Lawford, Sir Robert Hill, Sir John Goodwin, Sir George Makins, Mr. Treacher Collins, Mr. J. Herbert Fisher, Mr. M. L. Hepburn, and Mr. H. P. Sturgis. There was also a short musical programme.